

Greene County Hazard Mitigation Plan



2015 Plan Update



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Prepared under the direction of the Hazard Mitigation Planning Committee, the Local
Emergency Planning Committee, and the Greene County Emergency Management Agency
by:



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Greene County Hazard Mitigation Plan

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Introduction

Greene County Hazard Mitigation Plan

On October 30, 2000, the United States Congress passed the Disaster Mitigation Act of 2000, also known as DMA2K. Among its other features, DMA2K established a requirement that in order to remain eligible for federal disaster assistance and grant funds, localities must develop and adopt hazard mitigation plans as a condition of receiving mitigation project grants under the Pre-Disaster Mitigation (PDM) Program and the Post-Disaster Hazard Mitigation Program (HMGP). On February 26, 2002 (updated October 1, 2002 and October 28, 2003), the Federal Emergency Management Agency (FEMA) published an Interim Final Rule (IFR) updated to the Final Rule (FR) on October 1, 2013 that provides the guidance and regulations under which such plans must be developed. The Final Rule (FR) provides detailed descriptions of both the planning process that localities are required to observe, as well as the contents of the plan that emerges. Section 201.6 (d) (3) mandates that a county update its plan every five years “to reflect changes in development, progress in local mitigation efforts, and changes in priorities.”

The Greene County Hazard Mitigation Plan is a multi-jurisdictional, multi- hazard mitigation plan. This plan fulfills the requirements set forth by the Federal Disaster Mitigation Act of 2000 (DMA 2000). It meets all eligibility requirements set forth by the Federal Emergency Management Agency (FEMA) for grant assistance. This plan covers the entire county including all unincorporated areas, the Town of Boligee, City of Eutaw, Town of Forkland, and the Town of Union. Other local governments that elected to participate in and adopt the plan are: the Greene County School Board and the Greene County Fire Association. Greene County will continue to comply with all applicable federal and state statutes and regulations related to hazard mitigation planning. In addition, Greene County will amend its plan whenever necessary to reflect changes in countywide hazard mitigation.

Authorities, Policies, Programs, and Resources

Section 409 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-228, as amended), Title 44 Code of Federal Regulations, as amended by Section 201 of the Disaster Mitigation Act of 2000 requires that all state and local governments develop a Hazard Mitigation Plan as a condition of receiving federal disaster assistance.

Local capabilities vary from one jurisdiction to another. Existing authorities, policies, programs, and resources available to accomplish hazard mitigation and expand on and improve existing policies and programs include the HMPC members, Volunteer Fire Departments, Greene County Highway Department, Greene County Sheriff's Office, Volunteer Fire Association, Greene County Emergency Management Agency/911, Greene County Commission, City and Town Councils, Water Departments, Greene County Board of Education, Town Clerks, Greene County Health System, Green County Department of Human Resources, Greene County Coroner, Green County Public Works, grant writer/consultant, utility fees, various plans as noted in **Table 1-1**, and annual budgets for the in-kind grant match requirements.

Funding

Funding for this plan update was made available through the Hazard Mitigation Grant Program (HMGP). The grant's Period of Performance is November 18, 2013 through January 18, 2015. The Greene County Emergency Management Agency (AEMA) and Lee Helms Associates, L. L. C. entered into an agreement to update the 2015 plan that was revised by the West Alabama Regional Commission (WARC) in 2009 and expires November 24, 2014.

Scope

The Greene County Hazard Mitigation Plan includes all incorporated and unincorporated areas in Greene County. The plan addresses all natural and man-made hazards identified by the Federal Emergency Management Agency. All hazards that may affect Greene County and its residents are identified. Hazard mitigation strategies are discussed in terms of goals, objectives and mitigation actions. Responsibility for implementation of strategies is discussed and possible funding sources are identified.

Purpose

"Mitigation is the cornerstone of emergency management. It's the ongoing effort to lessen the impact disasters have on people's lives and property through damage prevention and flood insurance" (<http://www.fema.gov/fima/>). The Greene County Hazard Mitigation Plan is an effort to identify mitigation strategies that address the hazards to which Greene County is the most vulnerable. This plan is only one of many means Greene County will take to achieve a safer,

more hazard resistant environment for its residents.

Section One: Planning Process

Plan Update Process

The hazard mitigation planning update process began in February of 2014 after the Greene County Emergency Management Agency (GCEMA) was awarded a planning grant from the Alabama Emergency Management Agency (AEMA). The GCEMA received 75 percent funding from the Federal Emergency Management Agency (FEMA). The remaining 25 percent was provided locally through in-kind services. The 2015 plan update reflects the same basic structure as the 2009 plan. All available existing plans, studies, reports, and technical information were reviewed, to include: the Alabama Hazard Mitigation Plan; Eutaw's Zoning Ordinance, Strategic Plan, Building Codes, and Floodplain Management Plan; the county's comprehensive plan, strategic plan, Emergency Operations Plan, Critical Facilities Map, Existing Land Use Map, and the Tenn-Tom Waterway Industrial District Plan.

The Greene County mitigation plan is the representation of the county's commitment to reduce risks from natural. In doing this, the number, location, extent and probability of natural disasters occurring within the area was assessed. Worksheets were developed by LHA and completed by the Hazard Mitigation Planning Committee members that represented each jurisdiction and/or local government participating in the plan update. These worksheets, which included updating of each jurisdiction's data tables, critical facilities and mitigation strategies, were the basis for the plan. Next, mitigation actions that would reduce the loss of life or property in the area were considered. In doing this, all jurisdictions, local governments, first responders (police, fire and medical), and the general public were invited and encouraged to participate.

Continued Public Participation

After the initial plan was completed in 2004, it was made available for ongoing public view and comment at all City and Town Halls, the Greene County Courthouse, and the West Alabama Regional Commission. Each jurisdiction was instructed that amendments or additions could be made to that plan at any time. Additional opportunities for comment will be provided at

annual meetings held by the Greene County EMA. HMPC representatives will seek public participation, after the plan has been approved and during the plan's implementation, monitoring, and evaluation periods, through presentations made to elected officials, schools, community groups (Kiwanis, Civic Clubs, etc.), public meetings, and annual questionnaires or surveys.

Hazard Mitigation Planning Committee

Before beginning the plan update process, LHA staff coordinated with Iris Sermon, Greene County EMA Director, to review the hazard mitigation planning committee. Existing members were confirmed to continue service. Replacements were made to fill vacancies as needed. New members were added to represent local governments participating in the plan for the first time, if any. Ms. Sermon assumed the responsibility as Chairman of the Hazard Mitigation Planning Committee and also invited the Local Emergency Planning Committee (LEPC) to participate in the planning process.

The existing Hazard Mitigation Planning Committee (HMPC) consisted of the following members:

Greene County

Iris Sermon, EMA Director/E-911
Hodges Smith, EMA Deputy Director
John Bullock, Highway Department Assistant Superintendant
Hubert Finch, Sheriff's Department Chief Investigator
Jonathan M. Benison, Sheriff's Department

Town of Boligee

J. E. Morrow, Town Councilman

City of Eutaw

Hattie Edwards, Mayor
La' Jeffery Carpenter, Council Member
Larry Sanford, Water Department Board Member
Ronald K. Smith, Coroner

Fire Departments

George S. Henderson, Springfield VFD Fire Chief

W. L. Walker, Springfield VFD

F. Hendrix Hughes, VFD

Willie Austin, Dollarhide VFD

Bennie Abrams III, Eutaw Fire Chief

Harper Smirtz, Knoxville Fire Chief

Ronald K. Smith, Eutaw FD

Town of Forkland

Preston Davis, Forkland Town Council

Town of Union

Marilyn Sanford, Town of Union, Clerk

Participation Guidelines

The Chairman of the Hazard Mitigation Planning Committee set forth a list of participation guidelines for the Hazard Mitigation Planning Committee:

1. At least one appointed representative from each participating local government should attend all committee meetings. In the event of extenuating circumstances, the local government may send a non-appointed representative.
2. Each local government should submit requested information to Greene County EMA or LHA in a timely manner. Local governments should meet time frames and deadlines established by the committee. In the event of extenuating circumstances, the Hazard Mitigation Planning Committee Chairman may approve late submissions.
3. Committee members should fully cooperate with LHA and the Greene County EMA during the update and finalization of the Greene County Hazard Mitigation Plan by providing the best available information necessary to complete the plan.
4. Each participating jurisdiction must review mitigation strategies from the 2009 plan

for which they were responsible and provide new actions they may pursue in the future.

Committee and Public Meeting Schedule and Participation

Each jurisdiction, public and private non-profits, and general public, as well as the surrounding counties of Pickens, Sumter, Marengo, Hale, and Tuscaloosa were invited and encouraged to participate in each of the committee meetings – either by mail, email, or phone. In the event they were unable to attend the meetings they were required to obtain meeting materials from the Greene County EMA or LHA prior to or immediately following the missed meeting. Meeting materials were completed and returned via mail, fax, email, or by scheduling an individual meeting with the Greene County EMA and/or the LHA for the local government to be counted as an active participant in the planning process. Public meeting notices were published in the Greene County Democrat and the Greene County Independent at least seven days prior to the meeting date and included contact information for assistance.

Attendees at the meetings were asked to review and complete meeting materials that required collaboration, and provide other needed data. Some individuals participated with and contributed to more than one jurisdiction as deemed appropriate.

INITIAL MEETING AGENDA

2015 GREENE COUNTY HAZARD MITIGATION PLAN UPDATE

Tuesday, June 10, 2014 @ 1 p.m.

Eutaw City Hall Courtroom – 116 Main Street, Eutaw, AL 35462

1. Introductions
 - Sign-in sheets – please print and make sure your email is on the form
2. Project Background
 - 2009 plan update was prepared by the West Alabama Planning Commission under the direction of the Hazard Mitigation Planning Committee, the Local Emergency Planning Committee, and the Greene County Emergency Management Agency and adopted by:
 - Greene County – Unincorporated
 - Boligee – Town
 - Eutaw – City
 - Forkland – Town
 - Union – Town
 - Greene County Fire Association – Special District
 - Greene County School Board – Special District
 - 2014-2015 plan update will be prepared by Lee Helms Associates, L. L. C. under the direction of the Hazard Mitigation Planning Committee, the Local Emergency Planning Committee, and the Greene County Emergency Management Agency
3. Project Participation
 - Identify opportunities for public input into the 2015 plan update
 - Identify potential plan meeting participants that are not present today (municipalities, school boards, engineers, hospitals, surrounding county EMAs, fire departments, etc.)
 - PNP's are their own applicant
4. Project Schedule
 - 2009 plan update expires November 24, 2014
 - Period of Performance for the grant is November 18, 2013- January 18, 2015
 - Goal date for draft plan to be submitted in order to be approved before current plan expires: Friday, July 11, 2014
 - AEMA/Local Review = 30 days; Local response to a request for information (RFI) = 30 days; AEMA review of local response to RFI = 30 days; FEMA Review = 45 days (allowing 135 days at the least for plan approval)
 - There will be an initial, mid-term, and final meeting. Committee members will be made aware of the meetings via email unless other means is requested. Information may be sent to LHA by fax 205-280-0543 or email to renee@leehelmsllc.com. If you have any questions or need assistance, call LHA at 205-280-3027.
5. Project Tasks for this Meeting
 - All general public attendees are to complete the form titled: "Citizen Input on Hazard Mitigation Planning" and leave completed form with LHA representative
 - Local EMA Director is to complete Questionnaire #1 and return to LHA representative
 - Local EMA Director is to provide LHA with a copy of the media release for this meeting
 - Update 2009 plan information – see handouts
 - Discuss in-kind contributions for local match to this planning grant
 - Set date and location for next meeting

Tuesday, June 10, 2014 at 1 p.m.

Eutaw City Hall Courtroom – 116 Main Street, Eutaw, AL 35462

Greene County Hazard Mitigation Planning Meeting 1

The Chairman of the Hazard Mitigation Planning Committee, Ms. Iris Sermon, opened the meeting. Lee Helms Associates, L. L. C. reviewed the original plan with committee members and attendees and explained the update process. Attendees were given worksheets and other materials related to the agenda topics in order to review and provide data for the update. A total of 20 committee members or designees attended the meeting, along with one LHA representative. No members of the general public were in attendance.

- Iris Sermon, EMA Director/E-911
- Hodges Smith, EMA Deputy Director
- John Bullock, Highway Department Assistant Superintendent
- Hubert Finch, Sheriff's Department Chief Investigator
- Jonathan M. Benison, Sheriff's Department
- J. E. Morrow, Town Councilman
- Hattie Edwards, Mayor
- La'Jeffery Carpenter, Council Member
- Larry Sanford, Water Department Board Member
- Ronald K. Smith, Coroner/Eutaw Fire Department
- George S. Henderson, Springfield VFD Fire Chief
- E. L. Walker, Springfield VFD
- F. Hendrix Hughes, VFD
- Willie Austin, Dollarhide VFD
- Bennie Abrams III, Eutaw Fire Chief
- Harper Smirtz, Knoxville Fire Chief
- Lee Helms, Lee Helms Associates, L. L. C.
- Preston Davis, Town of Forkland, Councilmember
- Emma Louie, Greene County BOE, Superintendent
- Marilyn Sanford, Town of Union, Clerk

GREENE COUNTY

Tuesday, June 10, 2014 at 1 p.m. - Eutaw City Hall Courtroom - 116 Main Street, Eutaw, AL 35462

INITIAL HAZARD-MITIGATION PLANNING MEETING SIGN-IN SHEET

(PLEASE PRINT CLEARLY)

NAME	AGENCY OR DEPARTMENT/ JOB TITLE	PHONE/ FAX	E-MAIL
Ernest Wallace	Agency: Eutaw Fire Dept Job Title: Board Member	Phone: 372 0904 Fax: —	—
John Bullock	Agency: Greene Co Hwy Dep Job Title: ASST Superintendent	Phone: 265-346-9198 Fax: 205-372-3302	
Hubert Finch	Agency: Greene Co S.O. Job Title: Chief Investigator	Phone: 205 374 0334 Fax: 205 372 5810	hfinch52@gmail.com
JONATHAN M. BENISON	Agency: Greene Co S.O. Job Title: Sheriff	Phone: 205-372-3242 Fax: 205-372-4600	g.c.sheriff@greene.co.al.us
Hodges Smith	Agency: EMA/Am Association Job Title: Deputy Director	Phone: 205 657 1294 Fax: hodges1294@aol.com	
F. Hendrix Hughes	Agency: Vol Fire Dept Job Title:	Phone: 205-372-4203 Fax:	fhughes6msn.com



GREENE COUNTY

Tuesday, June 10, 2014 at 1 p.m. - Eutaw City Hall Courtroom - 116 Main Street, Eutaw, AL 35462

INITIAL HAZARD-MITIGATION PLANNING MEETING SIGN-IN SHEET

(PLEASE PRINT CLEARLY)

NAME	AGENCY OR DEPARTMENT/ JOB TITLE	PHONE/ FAX	E-MAIL
Bennie Thompson	Agency: Gtaw Fire/CDP Job Title: Chief	Phone: 205-372-4934 Fax: 205-372-0547	gemstone1@bellsouth.net
Hayden Smith	Agency: KNOXVILLE Job Title: Chief	Phone: 205 361-2273 Fax: 205 372-4817	24 KEOPSAKE WAY KNOXVILLE AL 35469
Willie Austin	Agency: Delta County V.F.D. Job Title:	Phone: 205-377-1042 Fax:	Pennybox48@yahoo.com
BOHIGEE TOWN	Agency: BOHIGEE TOWN Job Title: Councilman	Phone: 205-496-0473 Fax:	
Ronald K. Smith	Agency: Eutaw Fire Dept/Coroner Job Title:	Phone: 205-315-1257 Fax: 205-372-0547	gcoroner@gmail.com
Mr. Jeffery Carpenter	Agency: Greene County / Eutaw City Job Title: Deputy / Board Member	Phone: (205) 315-1948 Fax:	Carpenterjeffery@yahoo.com



GREENE COUNTY

Tuesday, June 10, 2014 at 1 p.m. – Eutaw City Hall Courtroom – 116 Main Street, Eutaw, AL 35462

INITIAL HAZARD-MITIGATION PLANNING MEETING SIGN-IN SHEET

(PLEASE PRINT CLEARLY)

NAME	AGENCY OR DEPARTMENT/ JOB TITLE	PHONE/ FAX	E-MAIL
Mayor Hattie Edwards	Agency: City of Eutaw Job Title: Mayor	Phone: 205/372-4212 Fax: 205-372-0748	Hattie.Edwards@yahoo.com
Iris Serman	Agency: Gr 641-1 / EMA Job Title: Director	Phone: 205-372-1911 Fax: 205-372-5911	iserman@att.net
Larry Sanford	Agency: City of Eutaw Job Title: Larry Sanford	Phone: 205-372-4212 Fax: 205-372-0748	
Lee Helms	Agency: Lee Helms Associates Job Title: Owner	Phone: 205-280-3027 Fax: 205-280-0543	lee@leehelmsllc.com
George S. Henderson	Agency: Springfield VFD Job Title: Fire Chief	Phone: 205-372-3351 Fax: 205-496-0758	springfieldvfd@outlook.com
	Agency: Job Title:	Phone: Fax:	



SECOND MEETING AGENDA

2015 GREENE COUNTY HAZARD MITIGATION PLAN UPDATE

Tuesday, August 5, 2014 @ 1 p.m.

Eutaw City Hall Courtroom – 116 Main Street, Eutaw, AL 35462

1. Introductions

- Sign-in sheets – please print and make sure your email is on the form.

2. Project Schedule Reminder

- 2009 plan update expires November 24, 2014
- Period of Performance for the grant is November 18, 2013 – January 18, 2015
- **Goal date for draft plan to be submitted** in order to be approved before current plan expires: **Friday, July 11, 2014**
 - AEMA/Local Review = 30 days; Local response to a request for information (RFI) = 30 days; AEMA review of local response to RFI = 30 days; FEMA Review = 45 days (allowing 135 days at the least for plan approval)
- There will be an initial, mid-term, and final meeting. Committee members will be made aware of the meetings via email unless other means is requested. Information may be sent to LHA by fax 205-280-0543 or email to renee@leehelmsllc.com. If you have any questions or need assistance, call LHA at 205-280-3027.

3. Project Tasks for this Meeting

- All general public attendees are to complete the form titled: “Citizen Input on Hazard Mitigation Planning” and leave completed form with LHA representative
- Local EMA Director is to provide LHA with a copy of the media release for this meeting
- Update 2009 plan information – see handouts Discuss in-kind contributions for local match to this planning grant
- Set date and location for next meeting

Tuesday, August 5, 2014 at 1 p.m.

Eutaw City Hall Courtroom – 116 Main Street, Eutaw, AL 35462

Greene County Hazard Mitigation Planning Meeting 2 (Mid-Term)

The Chairman of the Hazard Mitigation Planning Committee, Ms. Iris Sermon, opened the meeting. Lee Helms Associates, L. L. C. reminded the committee members and attendees of the project schedule. Attendees were given worksheets and other materials related to the agenda topics in order to review and provide data for the update. These worksheets were previously emailed to participants with instructions on what information needs updating. A total of 25 committee members or designees attended the meeting, along with one LHA representative and no members of the general public. Those attending the initial meeting, but not this meeting, were contacted by phone, in person, email, or a combination thereof.

- Mollie M. Gaines, Greene Co. Assoc. of VFD
- Elzora C. Fluker, Greene County Commission Vice Chairman
- Ronald K. Smith, Eutaw FD and Green County Coroner
- Lee Helms, Lee Helms Associates, L. L. C.
- Sevese Strode, Lower Gainesville Rd. VFD, Vice President
- Johnni Strode Morning, Lower Gainesville Rd. VFD, Member
- Eddie M. Brown, Boligee VFD, Vice President
- Susie Morrow, Boligee VFD, Secretary
- Esmer L. Walker, Springfield VFD
- Sharon Warren, Lower Gainesville Rd. VFD, Member
- Shaquille Harkness, Lower Gainesville Rd. VFD, Member
- Calvin Culliver, Greene County Public Works, Asst. County Engineer
- Henry (Hank) McWhorter, Greene Co. Sheriff Office, Chief Deputy
- Melvin Jolly, Greene County DHR Supv./D'hde VFD Fire Chief
- James E. Morrow, Town of Boligee, Councilman
- Fred Hendrix Hughes, Mantua/Lewiston FD, Fire Chief

- Wilson Morgan, Greene County DHR, Director
- T. Smith, Greene County Commission, Commissioner
- Iris Sermon, Greene County EMA/911 Director
- Brenda Burke, Greene County Commission, HR Director/Safety Director
- Hodges Smith, EMA/Fire Association Deputy Director
- Hubert Finch, Greene County SO, Chief Investigator
- Lisa Flowers, Greene County Health System, Quality Manager
- Jamie Cox, Lower Gainesville Rd., President
- Willie Austin, Dollarhide VFD, Sec. EPC

GREENE COUNTY

Tuesday, August 5, 2014 at 1 p.m. – Eutaw City Hall Courtroom – 116 Main Street, Eutaw, AL 35462

MID-TERM HAZARD-MITIGATION PLANNING MEETING SIGN-IN SHEET

(PLEASE PRINT CLEARLY)

NAME	AGENCY OR DEPARTMENT/ JOB TITLE	PHONE/ FAX	E-MAIL
IRIS SERMON	Agency: Greene Co EMA/911 Job Title: Director	Phone: 205/372-1911 Fax: 205/372-5911	isermon@mtt.net
Brenda Burke	Agency: Greene County Commission Job Title: HR Dir / Safety Director	Phone: 205-372-6908 Fax: 205-372-0499	b.burke@greencol.net
Hodges Smith	Agency: EMA / Fire Protection Job Title: Deputy Director	Phone: 205 657 1794 Fax:	hodges.h@mtt.com
Hubert Finch	Agency: Greene County S.O. Job Title: Chief Investor	Phone: 205 372-3152 Fax: 205 372-5810	h.finch52@gmail.com
LISA FLOWERS	Agency: Greene County Health System Job Title: Quality Manager	Phone: 205 372 3368 Fax: 205 372 2716	l.flowers@gchealth.com
JAMIE COX	Agency: Lower GAINESVILLE RD Job Title: PRESIDENT	Phone: Fax:	



GREENE COUNTY

Tuesday, August 5, 2014 at 1 p.m. – Eutaw City Hall Courtroom – 116 Main Street, Eutaw, AL 35462

MID-TERM HAZARD-MITIGATION PLANNING MEETING SIGN-IN SHEET

(PLEASE PRINT CLEARLY)

NAME	AGENCY OR DEPARTMENT/ JOB TITLE	PHONE/ FAX	E-MAIL
Henry (Hank) McWhorter	Agency: Greene Co. Sheriff Off. Job Title: Chief Deputy	Phone: 205-372-3242 Fax: 205-372-4600	Henry.McWhorter@alacounty.gov
Melvin Jolly	Agency: Greene County DHR/Director Job Title: Fin. Support Sup. / Fire Chief	Phone: (205) 372-5006 Fax: (205) 372-0125	melvin.jolly@dhr.alabama.gov
JAMES E. MORROW	Agency: TOWN OF BOHIGEE Job Title: Councilman	Phone: 205-496-0473 Fax:	J.E.MORROW1939@gmail.com
Fred Hendrix Hughes	Agency: MANTUA/LEWISTON FIRE DEPT Job Title: Fire Chief	Phone: 205-372-4203 Fax:	fhughes@msn.com
Wilson Morgan	Agency: Greene County DHR Job Title: Director	Phone: 205-372-5025 Fax: 205-372-0125	W.morgan@dhr.alabama.gov
Tennison Smith	Agency: Greene County Commission Job Title: Commissioner	Phone: 205-372-3349 Fax:	



GREENE COUNTY

Tuesday, August 5, 2014 at 1 p.m. – Eutaw City Hall Courtroom – 116 Main Street, Eutaw, AL 35462

MID-TERM HAZARD-MITIGATION PLANNING MEETING SIGN-IN SHEET

(PLEASE PRINT CLEARLY)

NAME	AGENCY OR DEPARTMENT/ JOB TITLE	PHONE/ FAX	E-MAIL
Severe Strade	Agency: Lower Gainesville Rd. VFD Job Title: Vice President	Phone: 205-372-2146 Fax:	SStrade33@aol.com
Johnni Strodt Morning	Agency: Lower Gainesville VFD Job Title: Member	Phone: (205) 372-4644 Fax: —	JSMorning193@yahoo.com
Eddie M. Brook	Agency: Boligee Volunteer Fire Dept Job Title: Vice President	Phone: (205) 336-832 Fax:	Boligee VFD@outlook.com
Susan Morrow	Agency: Boligee VFD Job Title: Secretary	Phone: 205-372-7904 Fax:	sspeaklord@aol.com Boligee VFD@outlook.com
Esmeralda L. Ke Cruz	Agency: Spring Hill VFD Job Title: Fire-Fighter	Phone: 205 372 0904 Fax: 5A ~	
	Agency: Job Title:	Phone: Fax:	



GREENE COUNTY

Tuesday, August 5, 2014 at 1 p.m. – Eutaw City Hall Courtroom – 116 Main Street, Eutaw, AL 35462

MID-TERM HAZARD-MITIGATION PLANNING MEETING SIGN-IN SHEET

(PLEASE PRINT CLEARLY)

NAME	AGENCY OR DEPARTMENT/ JOB TITLE	PHONE/ FAX	E-MAIL
Mollie M. Gaines	Agency: Greene Co Assoc. of Vets. F.D. Job Title: Secretary	Phone: 205 292-7912 Fax: 205 372-4466	gaines-mollie@co.net gaines-mollie@co.net
Elzora C. Fuller	Agency: Greene Co Commissioner Job Title: Vice Chair	Phone: 205/372-2160 Fax:	elzora.fuller@hotmail.com
Ronald K. Smith	Agency: Greene County Corner & Outlets Job Title: Corner / E	Phone: 205-523-3021 Fax: 205 372 4934	gcoroner@gmail.com
Lee Helms	Agency: LHA Job Title: Owner / Consultant	Phone: 205-280-3027 Fax: 205-280-0543	lee@leehelmsllc.com
	Agency: Job Title:	Phone: Fax:	
	Agency: Job Title:	Phone: Fax:	



GREENE COUNTY

Tuesday, August 5, 2014 at 1 p.m. – Eutaw City Hall Courtroom – 116 Main Street, Eutaw, AL 35462

MID-TERM HAZARD-MITIGATION PLANNING MEETING SIGN-IN SHEET

(PLEASE PRINT CLEARLY)

NAME	AGENCY OR DEPARTMENT/ JOB TITLE	PHONE/ FAX	E-MAIL
SHARON WARREN	Agency: LOWER GAINESVILLE ROAD Job Title: MEMBER	Phone: 205-496-4666 Fax:	SHELL.WARREN@AOL
SHAQUILLE HARKNESS	Agency: LOWER GAINESVILLE ROAD Job Title: MEMBER	Phone: 205-496-4741 Fax:	SHELL.WARREN1@AOL
Calvin Cullins	Agency: Green County Public Works Job Title: Asst. County Engineer	Phone: 205-372-3302 Fax: 205-372-3303	greeneeng@gmail.com
	Agency: Job Title:	Phone: Fax:	
	Agency: Job Title:	Phone: Fax:	
	Agency: Job Title:	Phone: Fax:	



GREENE COUNTY

Tuesday, August 5, 2014 at 1 p.m. – Eutaw City Hall Courtroom – 116 Main Street, Eutaw, AL 35462

MID-TERM HAZARD-MITIGATION PLANNING MEETING SIGN-IN SHEET

(PLEASE PRINT CLEARLY)

NAME	AGENCY OR DEPARTMENT/ JOB TITLE	PHONE/ FAX	E-MAIL
Willie Austin	Agency: Dollyville VFD Job Title: Sect. EAC	Phone: 205-377-1042 Fax:	Funbox48@yahoo.com
	Agency: Job Title:	Phone: Fax:	
	Agency: Job Title:	Phone: Fax:	
	Agency: Job Title:	Phone: Fax:	
	Agency: Job Title:	Phone: Fax:	
	Agency: Job Title:	Phone: Fax:	





**GREENE COUNTY, AL
EMERGENCY MANAGEMENT AGENCY**

*Iris Sermon, EMA Interim Director
P.O. Box 656, Eutaw AL 35462
Phone: 205-372-1911*

PUBLIC MEETING

HAZARD MITIGATION PLANNING MEETING

AUGUST 5, 2014

1 PM

EUTAW CITY HALL - COURT ROOM

The Public, private non-profits, municipalities, school boards, universities/colleges, water/sewer boards, fire departments and elected officials are among those invited and encouraged to attend.

Participation is required in order to apply for federal hazard mitigation grants in the future!!

(Through Greene County's last "Declaration of Emergency" we were eligible to apply and received a Mitigation Grant for community and individual storm shelters)

HMPC members distributed “Citizen Input on Hazard Mitigation Planning” forms to their communities to ensure their input into the plan update - as no private citizens attended the public meetings. A total of 64 forms were submitted to the Greene County EMA, from which the information was used in this plan update and consolidated on the form below. The original forms are on file. This process was used to ensure citizens understand the community’s efforts to mitigate future disaster experiences and to provide citizens an opportunity to input their community’s vulnerabilities and mitigation activities. This information informs the plan update’s content. As important, is educating the public about hazards and risks in the community, types of actions that can be taken to mitigate these risks, and what impacts these risks have upon the citizens.

CITIZEN INPUT ON HAZARD MITIGATION PLANNING

(64 forms submitted)

Where in the county do you live (Which city or township?)	Forkland, Greene, Eutaw, Springfield, Boligee, Lewiston, Union, Mantua, Knoxville, Jena, Clinton, Dollarhide
What is your zip code at home?	36740, 36740, 35462, 35462, 35443, 35462, 35462, 35469, 35443
Do you work with Law Enforcement, Fire Service, Emergency Medical Services, Public Health, or Emergency Management? (Yes or No)	8 out of 64

Which of these emergency events have occurred at your home or in your neighborhood during the past ten years?

	EVENT	YES	NO
A	Brush or grass fire?	36	28
B	Building fire?	35	29
C	Severe thunderstorm?	43	21
D	Tornado?	26	38
E	Winter Weather?	40	24
F	Terrorism?	8	56
G	Drought?	26	38
H	Hazardous material spill or release from pipelines, trucks, trains, or aircraft?	10	54
I	Hazardous material spill or release from a facility?	4	60
J	Power failure for more than two or three hours?	46	18
K	Earthquake	8	56

Did you have to leave your home because of any of these events?

If so, which ones? List by letter designation: D, J, C, B

Did you lose time from work or school because of any of these events?

If so, which ones? List by letter designation: D, E, J, C

Which of the following events are you concerned about in the next 12 months?

	EVENT	YES	NO
A	Brush or grass fire?	38	26
B	Building fire?	32	32
C	Severe thunderstorm?	49	15
D	Tornado?	50	14
E	Winter Weather?	39	25
F	Terrorism?	18	46
G	Drought?	29	35
H	Hazardous material spill or release from pipelines, trucks, trains, or aircraft?	17	47
I	Hazardous material spill or release from a facility?	19	45
J	Power failure for more than two or three hours?	43	21
K	Earthquake	16	48

Of the concerns listed in question eight, please list the ones that you think are most likely to happen. List in priority by letter designation: A,B,C,E,G,J; A,B,C,D,E,F,G,H,I,J,K

Of the concerns that you think are most likely to happen from question 9, which one do you think would affect most of the population of your County? A,B,C,E,G,J; A,B,C,D,E,F,G,H,I,J,K

Of the concerns listed in question eight, please list the ones you think are least likely to happen. List by letter designation: K,F,H,I

Do you own a NOAA weather radio? YES 18 NO 45

If yes, is it on right now? YES 16 NO 17

Are you familiar with the Emergency Alert System YES 41 NO 17

Do you have a device that can sound an alarm to alert you to emergencies? YES 26
NO 30

Can you receive emergency warning information on your pager, cell phone, or wireless messaging devices? YES 27 NO 26 If no, would you like to? YES 18 NO 3

Do you have a family emergency plan for events such as a home fire? YES 46 NO 14

Do you have a safe place for shelter in or around your home? YES 30 NO 32

Are there emergency plans at your place of employment? YES 24 NO 23

If you are willing to, please provide your name, address, and a telephone number so that the County Emergency Management or the community representative may contact you if further input is needed:

Name	
Mailing Address	
Contact Number	
E-Mail	

Questions?

Interagency and Intergovernmental Coordination

Interagency and intergovernmental coordination also played a vital part in the development of this plan. Each of the agencies listed below were contacted via mail, email, fax, or telephone requesting the best available data that they could contribute to the 2015 plan update. All information provided was beneficial in completing risk and vulnerability assessments.

Federal Agencies

- National Weather Service provided storm event data
- United States Geological Survey provided information on general geology, earthquakes, sinkholes, land subsidence, and landslides
- U.S. Army Corp of Engineers and HAZUS-MH 2.1 provided information on dams
- Federal Emergency Management Agency provided information throughout the plan, including the National Flood Insurance Program information
- U.S. Department of Transportation's Hazardous Material Information System provided event data
- U.S. Department of Agriculture – Census of Agriculture provided land value per acre
- HAZUS-MH 2.1 provided estimation information on potential damage, economic loss, and social impacts from natural disasters

State Agencies

- Alabama Emergency Management Agency provided hazard information throughout the plan
- Geological Survey of Alabama provided information on general geology, earthquakes, sinkholes, and landslides
- Alabama Department of Economic and Community Affairs provided the Alabama Drought Management Plan, National Flood Insurance Program information and FEMA flood map update information
- Forestry Commission provided information regarding wildfires

Regional Agencies

- West Alabama Regional Commission provided area planning and development and transportation planning information, as well as maps pertaining to plan information

Local Agencies

- Greene County Emergency Management Agency provided assistance in gathering data

Academia

- University of Alabama - Department of Geology

Integration with Existing Plans

Careful attention was taken when updating the plan so that it would not contradict or conflict with any existing local subdivision regulations, zoning ordinances, comprehensive plans, or standard building codes. **Table 1-1** provides a list of the existing plans by jurisdiction. Wherever appropriate, the West Alabama Regional Commission's (WARC) economic development planning efforts have been integrated into this plan revision. Of possible interest to those viewing this plan, the WARC also provides Greene County with: 1) A Business Preparedness Toolkit and presentation that will help area businesses prepare for the effects of a disaster. The toolkit is tailored to Greene County and provides a sample preparedness and continuity of operations plan, support materials, and a listing of local emergency resources. 2) Data Books containing information from the 2010 Census and the 2006-2010 American Community Survey for the county, tracts, and municipalities. Maps of the counties and tracts are also included. The existing plans noted in **Table 1-1** will be integrated into the Greene County Hazard Mitigation Plan and vice versa, when appropriate. All plan developers will make a concerted effort to incorporate the hazard mitigation strategy, to include the goals and actions, into their planning mechanisms. Such an effort greatly reduces Greene County's risk of natural hazards. Plan developers and local government will utilize the risk assessment to inform other plans and policies, integrate plan goals with other community objectives, and implement mitigation actions through existing mechanisms.

Plan Adoption

All jurisdictions in Greene County, along with the Greene County School Board and the Greene County Fire Association have actively participated in the planning process. Representatives from each local government attended the meetings and provided completed worksheets that were vital in the update of the plan. Upon completion of the plan, the municipalities of Boligee, Eutaw, Forkland, and Union along with the Greene County Commission, Greene County School Board, and the Greene County Fire Association passed a formal resolution accepting, approving, and adopting the plan. By adopting this multi-jurisdictional hazard mitigation plan, the listed participates will be eligible applicants for mitigation grant funds through the Pre-Disaster Mitigation Program, Hazard Mitigation Grant Program, and the Flood Mitigation Assistance Program. Adopting Resolutions can be found in **Appendix II**.

**Table 1-1: Greene County
Existing Plans by Jurisdiction**

PLAN/POLICY	Bolgee	Eutaw	Forkland	Union	Unincorporated County
Comprehensive Plan	N	N	N	N	Y
Strategic Plan	N	Y	N	N	Y
Growth Management Plan	N	N	N	N	N
Capital Improvement Plan	N	N	N	N	Y
Zoning Ordinance	N	Y	N	N	N
Building Code	N	Y	N	N	N
Floodplain Management Plan	N	Y	N	N	N
Elevation Certificates	N	N	N	N	N
Drainage Ordinance	N	N	N	N	N
Emergency Management Plan	N	N	N	N	Y
Critical Facilities Map	N	N	N	N	Y
Existing Land Use Map	N	N	N	N	Y
State Plan	N	N	N	N	N
Hazard Mitigation	Y	Y	Y	Y	Y
Strategic National Stockpile Plan	N	N	N	N	N
Other	N	N	N	N	Tenn-Tom Waterway Industrial District

Source: Participating Jurisdictions

Section Two: General Characteristics

Greene County's general characteristics remain the same as stated in the 2009 plan update. Census information has been updated to reflect data from the 2010 Census.

Greene County is located in west central Alabama. Tuscaloosa, Hale, Greene, Marengo and Sumter Counties border Greene County. The county has 647.11 square miles of land area and approximately 13 square miles of water area as reported by the 2010 Census. The county contains four municipalities: the Town of Boligee, City of Eutaw, Town of Forkland, and the Town of Union. See **Map 2-1: Greene County General Location Map**. Greene County is governed by County Commissioners elected by citizens in their commission districts. The chairmanship rotates among the commissioners every 12 months. An elected mayor and council serve each municipality. The City of Eutaw serves as the Greene County seat and is the center for local business and trade.

Greene County has one airport located in the City of Eutaw. The airport does not provide commercial service. Two rail lines service Greene County. Utilities in Greene County include electricity, gas, water, sewer, and solid waste. Alabama Power and Black Warrior EMC provide electrical service; Alabama Gas Corporation and Dowdle Gas supply gas. AT & T provides telecommunication services. Water and sewer service is provided by municipal or rural systems. Greene County and the City of Eutaw operate sewer systems. The Town of Boligee has a collection system from which sewage is pumped to the City of Eutaw for treatment. Most unincorporated areas are serviced only by septic tanks. Greene County operates a solid waste collection program and inert landfill.

Growth Trends

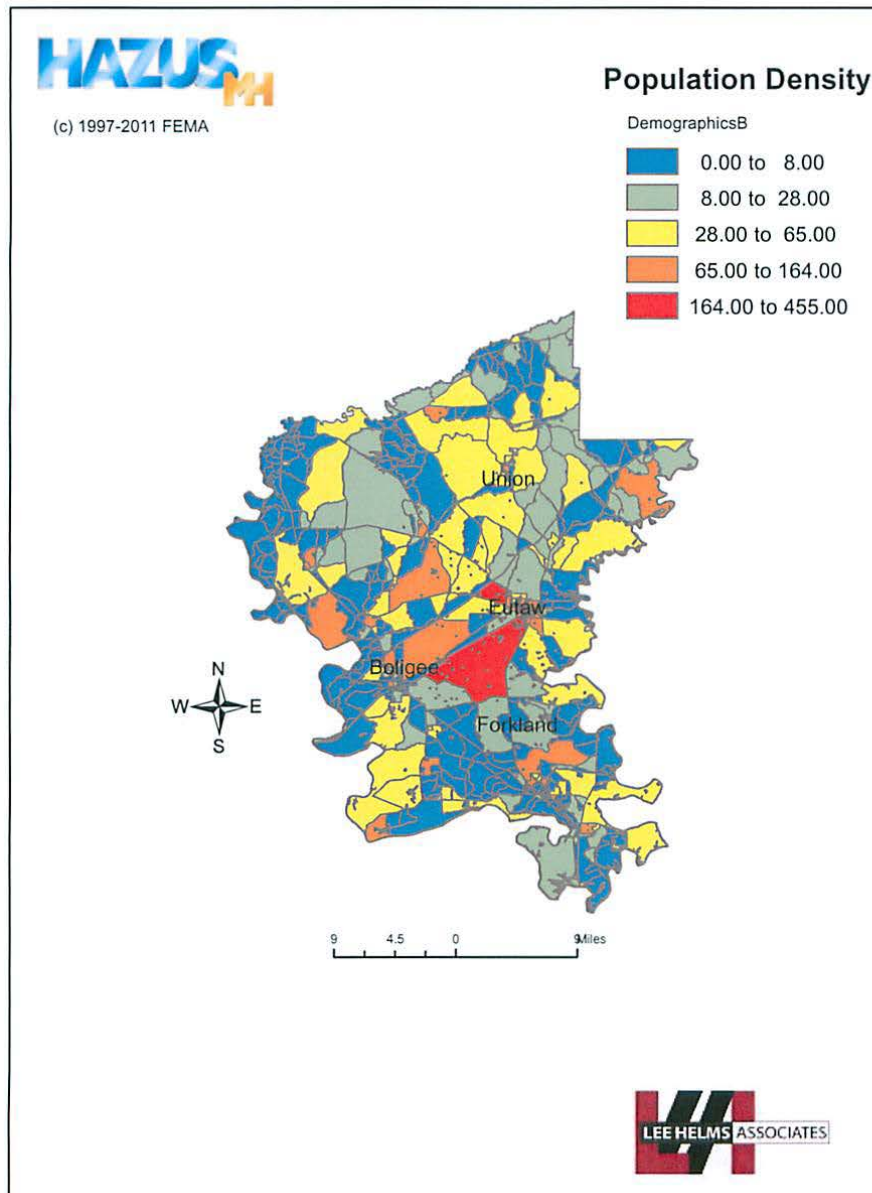
Greene County's population has grown slightly over the past twenty years. **Map 2-2: Greene County Population Density** depicts population concentrations in Greene County. **Table 2-1** below shows the growth trends for the county and its municipalities compared to the State of Alabama.

Table 2-1: Growth Trends 1990-2013

	1990	2000	2010	2013	Change 1990-2013	
					Number	Percent
Boligee	268	369	192	323	-55	-20%
Eutaw	2,281	1,878	2,934	2,883	602	26%
Forkland	667	629	649	632	-35	-05%
Union	321	227	237	236	-85	-26%
Greene County	10,153	9,974	9,045	8,744	-1,409	-14%
Alabama	4,041,281	4,447,032	4,779,736	4,841,486	800,205	20%

Source: U.S. Bureau of Census 2010; Calculations by LHA

Map 2-1: Greene County
General Location and Population Density Map



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General Geology

(Source: U. S. Department of the Interior/U. S. Geological Survey)

Geologic units in Greene County, Alabama include the following:

High terrace deposits (Pleistocene) - at surface, covers 1% of the area – is varicolored lenticular beds of poorly sorted sand, ferruginous sand, silt, clay, and gravelly sand. Sand consists primarily of very fine to very coarse poorly sorted quartz grains; gravel composed of quartz, quartzite, and chert pebbles. Lithology: terrace.

Selma Group; Mooreville Chalk (Cretaceous) – at surface, covers 15% of the area – is yellowish –gray to olive-gray compact fossiliferous clayey chalk and chalky marl. The unconformable contact at the base is characterized by a bed of glauconitic, chalky sand containing phosphate pellets and molds of fossils. The Arcola Limestone Member at the top consists of two to four beds of light-gray brittle, dense, fossiliferous limestone separated by beds of light-gray to pale-olive calcareous clay. Lithology: carbonate; mixed clastic/carbonate; sand; limestone; clay or mud.

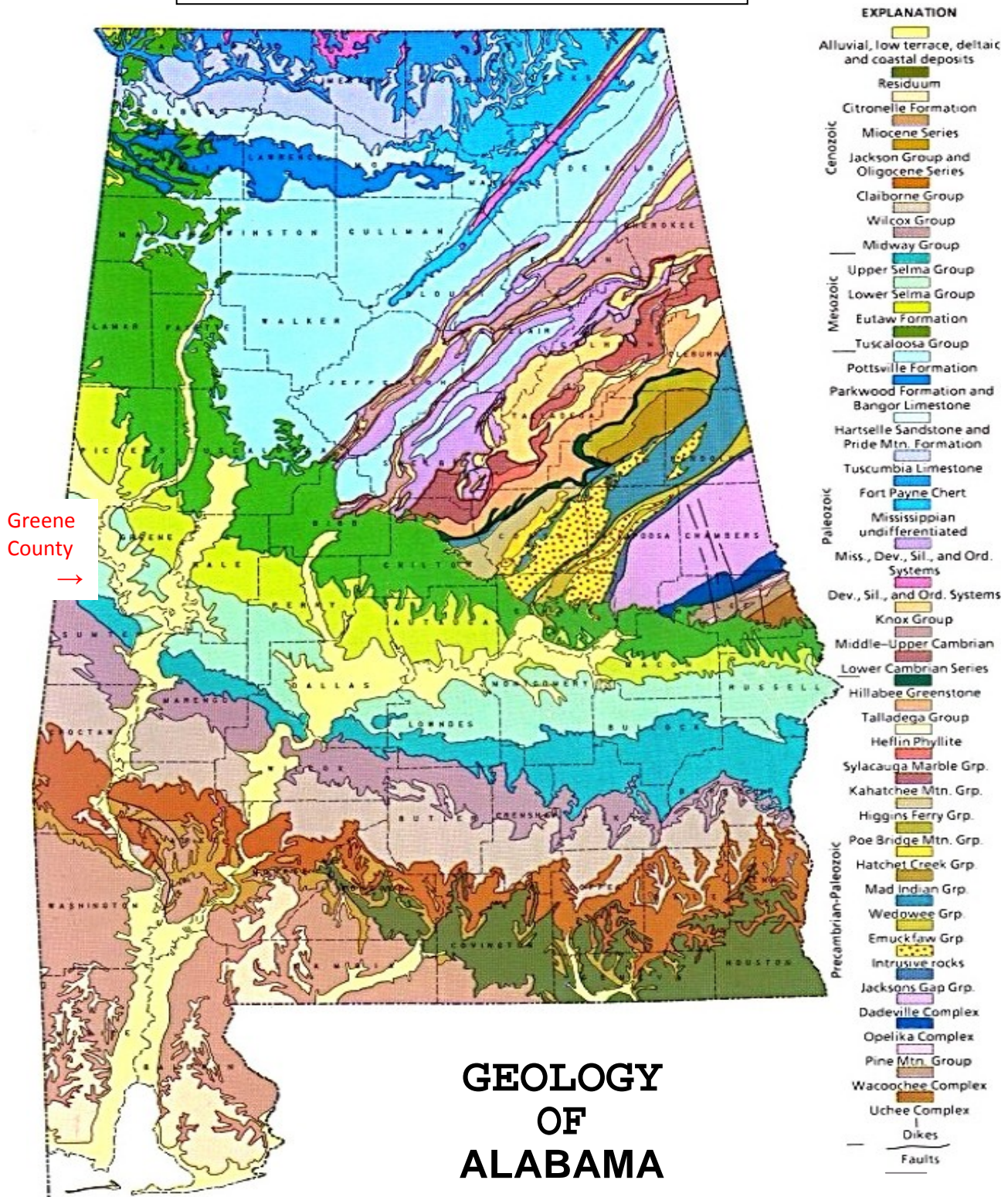
Eutaw Formation (Cretaceous) *at surface, covers 0.3% of this area* – is light-greenish-gray to yellowish-gray cross-bedded, well-sorted, micaceous, fine to medium quartz sand that is fossiliferous and glauconitic in part and contains beds of greenish-gray micaceous, silty clay and medium-dark-gray carbonaceous clay. Light-gray glauconitic fossiliferous sand, thin beds of sandstone and massive accumulations of fossil oyster shells occur locally in the upper part of the formation in western AL (Tombigbee Sand Member). In eastern AL thin to thick-bedded accumulations of the fossil oyster *Ostrea cretacea* Morton occur throughout much of the formation. Lithology: sand; clay or mud; sandstone.

Selma Group; Demopolis Chalk (Cretaceous) - at surface, covers 2% of the area – is light-gray to medium-light-gray compact, brittle chalk overlain by abundantly fossiliferous chalky marl, very clayey chalk, and calcareous clay (Bluffport Marl Member). In south-central Montgomery County the Demopolis is split into two eastward extending tongues by a westward-extending tongue of the Cusseta Sand Member of the Ripley Formation. The lower tongue is pale-olive to yellowish-gray silty to finely sand, micaceous, fossiliferous chalk that eastward becomes more sandy and merges with the Cusseta in central Bullock County. The upper tongue is yellowish-gray clayey, very finely sandy, micaceous chalk that merges with the Ripley in southeastern

Montgomery County. Lithology: carbonate; clay or mud; sand.

Alluvial, coastal and low terrace deposits (Holocene) - at surface, covers 0.1% of the area – is varicolored fine to coarse quartz sand containing clay lenses and gravel in places. Gravel composed of quartz and chert pebbles and assorted metamorphic and igneous rock fragments in streams near the Piedmont. In areas of the Valley and Ridge province gravel composed of angular to subrounded chert, quartz, and quartzite pebbles. Coastal deposits include fine to medium quartz sand with shell fragments and accessory heavy minerals along Gulf beaches and fine to medium quartz sand, silt, clay, peat, mud and ooze in the Mississippi Sound, Little Lagoon, bays, lakes, streams, and estuaries. Lithology: beach sand; alluvium.

Figure 2-1: Geology of Alabama
(Source: University of AL – Geology Department)



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Section Three: Risk Assessment

The risk assessment process is necessary to identify those natural hazards that pose a threat to Greene County and its municipal jurisdictions. This process used information provided by members of the Greene County Hazard Mitigation Planning Committee to identify these hazards.

The county's Hazard Probability Assessment Summary is shown in **Table 3-1**. A zero denotes no data is available to determine the probability or affected area. Each jurisdiction has an individual hazard probability assessment shown in Section Five of the plan.

Table 3-2 shows the hazards that pose a threat to each jurisdiction. Each jurisdiction was responsible for identifying the hazards that pose a threat to their community. During the 2009 plan update and for subsequent plan updates, tsunami/volcano/ typhoon was removed from the plan based on committee consensus that the hazard(s) did not pose a threat to the county or its jurisdictions.

Table 3-3 provides the prioritized occurrence threat by jurisdiction based on past events. Occurrence prioritizations were based on the National Oceanic and Atmospheric Administration (NOAA)-National Climatic Data Center (NCDC) reports of occurrences. Hazards are prioritized highest to least threat designating the hazard with the highest threat of occurrence as number one.

Table 3-4 provides the mitigation actions prioritization by jurisdiction. Each jurisdiction was responsible for prioritizing their proposed mitigation actions for the next five years. The jurisdictions took into consideration the impacts of hazards they had experienced over the past five years, as well as the mitigation actions available to help protect their jurisdictions and citizens.

Tables 3-5 is the cornerstone for the hazard profiles that follow in this section. This table contains data from the NOAA NCDC for a defined ten-year study period of January 1, 2003 – December 31, 2013. The table shows events for all hazard types and provides the location, date, type, magnitude, deaths and injuries, dollar amounts for property and crop damages, and total damages.

As FEMA guidelines request that detailed event data be provided, the Hazard Mitigation Committee agreed upon the new ten-year study period as a means of establishing a corrected historical reference that utilized verifiable sources.

Event locations in the table labeled as “countywide” refer to an event that affected the entire

county, including all municipalities within. If there is an associated amount of damages, they are assumed to be countywide. Countywide events are also listed in each municipality's event table in the individual Jurisdiction Assessment located in Section Five. There are events labeled for specific unincorporated areas of the county that were identified as affected. Such events will not be repeated in the individual jurisdiction tables since the location was site specific and did not affect an incorporated jurisdiction.

Some events provided by the NOAA/NCDC are reported as statewide occurrences. Hurricanes, droughts, and winter storms often have this type of far-reaching impact. In cases such as this, the event is shown as a countywide event that affected all municipalities. The county's extent and probability of a hazard will be listed under each event description.

The extent of the hazard provides the range of magnitude or severity that could be experienced by the county if such an event occurred. The hazard is classified using terms of major, minor, and minimum based on the probability of future damage estimates providing information on the range of magnitude or severity the county can anticipate from potential hazardous events. A major ranking requires continuous action and participation from the entire community and has a 100% or greater chance of an annual occurrence. A minor ranking involves fewer people, effort, and area of community and has a 50% - 99% chance of an annual occurrence. A minimum ranking involves a small number of people and plans for a specific action and has a 49% or less chance of an annual occurrence.

Probability is the likelihood that events of particular severities will occur. The ability of scientists and engineers to calculate probability varies considerably depending on the hazard in question. In many areas, flood studies of various kinds can provide reasonably accurate estimates of how often water will reach particular places and elevations. On the other hand, tornadoes and earthquakes are nearly impossible to predict, except in the most general sense. The probability (frequency) of the various hazards is drawn from a combination of sources, expertise, and the NCDC Storm Event Database for Alabama.

For the 2015 plan update, the probability (%) that an identified hazard will occur on an annual basis was determined using the following formula:

Number of historical or reported events in a time period divided by the number of years the incidents occurred within = Probability of Future Annual Event Occurrences

Example: 13 Extreme Temperature events experienced divided by a 6 year period;

13 divided 6 = >100%

A similar formula was used to determine an estimate of the expected damages from each event:

Total amount of damages (in dollars) for each historical or reported event divided by the number of damage causing events within the time period = Estimate of expected future damages

Example: \$172,000 total reported hail damage from 2003-2013 with 21 of those being reported as damage causing; $\$172,000/21=\$8,190$

Table 3-1: Greene County Hazard Probability of Future Occurrence			
Natural Hazards	Number of Occurrences Between 2003-2013	Probability of Future Occurrence	Area Affected
Thunderstorm	29	>100%	Countywide
Lightning	0	0%	Countywide
Hail	27	>100%	Countywide
Tornado	9	90%	Countywide
Flood/Flash Flood	10	100%	Countywide
Droughts/Extreme Heat	15	>100%	Countywide
Winter Storm/Frost Freeze/Heavy Snow/Ice Storm/Winter Weather/Extreme Cold	7	70%	Countywide
Hurricane/Tropical Storm/Tropical Depression/High Wind/Strong Wind	8	80%	Countywide
Sinkhole/Expansive Soil	0	0%	N/A
Landslide	0	0%	N/A
Earthquake	3	30%	Countywide
Wildfire (3-year study period – 1,095 days)	54	>100%	Countywide
Dam/Levee Failure	0	0%	Boligee, Eutaw, Forkland, Unincorporated Areas
<i>Sources: NOAA NCDC Storm Events Database; Alabama Forestry Commission; Alabama Geological Survey; Homefacts.com; City-data.com</i>			
Methodology: Probability of Future Occurrences was expressed by dividing the total number of occurrences by the ten-year study period, with the exception of wildfire being a 3-year study period. Zero denotes no data available to determine the probability of future occurrence or areas affected.			

**Table 3-2: Greene County
Hazard Identification by Jurisdiction**

Natural Hazards	Boligee	Eutaw	Forkland	Union	Unincorporated County
Thunderstorm	X	X	X	X	X
Lightning	X	X	X	X	X
Hail	X	X	X	X	X
Tornado	X	X	X	X	X
Flood/Flash Flood	X	X	X	X	X
Drought/Extreme Heat	X	X	X	X	X
Winter Storm/Frost Freeze/ Heavy Snow/ Ice Storm/Winter Weather/Extreme Cold	X	X	X	X	X
Hurricane/Tropical Storm/ Tropical Depression/High Wind/Strong Wind	X	X	X	X	X
Sinkhole/Expansive Soil	X	X	X	X	X
Landslide	N/A	N/A	N/A	N/A	N/A
Earthquake	X	X	X	X	X
Wildfire	X	X	X	X	X
Dam/Levee Failure	X	X	X	N/A	X
Man-Made Hazards					
Hazardous Material Release	X	X	X	X	X
Arson/Incendiary Attack	X	X	X	X	X
Armed Attack	X	X	X	X	X
Conventional Bomb	X	X	X	X	X
Chemical Agent	X	X	X	X	X
Cyberterrorism	X	X	X	X	X
Agriterrorism	X	X	X	X	X
Biological Agent	X	X	X	X	X
Radiological Agent	X	X	X	X	X
Nuclear Bomb	X	X	X	X	X
<i>Sources: Participating Jurisdictions; Alabama Geological Survey</i>					
Key: X = Affects the jurisdiction; N/A = Not a threat to the jurisdiction					

**Table 3-3: Greene County
Prioritized Occurrence Threat by Jurisdiction Based on Past Events**

Natural Hazards	Boligee	Eutaw	Forkland	Union	Unincorporated County
Thunderstorm	6	3	5	5	2
Lightning	9	8	8	8	10
Hail	7	6	5	6	3
Tornado	9	7	6	7	6
Flood/Flash Flood	3	4	3	3	5
Drought/Extreme Heat	2	2	2	2	4
Winter Storm/Frost Freeze/ Heavy Snow/Ice Storm/ Winter Weather/Extreme Cold	5	5	4	4	8
Hurricane/Tropical Storm/ Tropical Depression/High Wind/Strong Wind	4	4	3	3	7
Sinkhole/Expansive Soil	9	8	8	8	10
Landslide	9	8	8	8	10
Earthquake	8	8	7	7	9
Wildfire (3-year study period)	1	1	1	1	1
Dam/Levee Failure	9	8	8	8	10
Man-made Hazards					
Hazardous Material Release	1	1	3	2	1
Arson/Incendiary Attack	2	3	2	1	2
Armed Attack	9	8	1	4	9
Conventional Bomb	3	5	4	3	8
Chemical Agent	4	2	5	5	3
Cyber Terrorism	5	10	8	6	10
Agriterrorism	6	7	7	7	5
Biological Agent	8	6	6	8	4
Radiological Agent	7	4	9	9	7
Nuclear Bomb	10	9	10	10	6

Sources: NOAA NCDC Storm Events Database; Alabama Forestry Commission; National Forestry Service; Alabama Geological Survey

Hazards are prioritized with the highest threat of occurrence assigned number one based on hazardous events that have occurred within each jurisdiction over the past ten years, with the exception of wildfires that were based on events that have occurred over the past three years. Some natural hazards have equal threats to a jurisdiction; therefore, their threat number will be the same. These prioritized threats may or may not be the same as the mitigation actions prioritization.

TABLE 3-4: GREENE COUNTY HAZARD EVENTS

28 Thunderstorms Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
CLINTON	GREENE CO.	AL	04/07/2004	17:16	CST	Thunderstorm Wind	55 kts. EG	0	0	2.00K	0.00K
BOLIGEE	GREENE CO.	AL	04/10/2004	16:15	CST	Thunderstorm Wind	75 kts. EG	0	0	200.00K	1.600M
EUTAW	GREENE CO.	AL	12/07/2004	05:15	CST	Thunderstorm Wind	52 kts. EG	0	0	1.00K	0.00K
BOLIGEE	GREENE CO.	AL	03/07/2005	17:45	CST	Thunderstorm Wind	50 kts. ES	0	0	12.00K	0.00K
EUTAW	GREENE CO.	AL	04/06/2005	13:12	CST	Thunderstorm Wind	40 kts. EG	0	0	3.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	05/20/2005	17:19	CST	Thunderstorm Wind	54 kts. EG	0	0	11.00K	0.00K
EUTAW	GREENE CO.	AL	03/09/2006	17:04	CST	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
FORKLAND	GREENE CO.	AL	04/04/2008	13:50	CST-6	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
EUTAW	GREENE CO.	AL	06/29/2008	13:59	CST-6	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
LIZZIEVILLE	GREENE CO.	AL	07/04/2008	17:14	CST-6	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
EUTAW	GREENE CO.	AL	07/04/2008	17:17	CST-6	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
FORKLAND	GREENE CO.	AL	02/18/2009	16:08	CST-6	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
FORKLAND	GREENE CO.	AL	05/03/2009	12:20	CST-6	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
EUTAW	GREENE CO.	AL	06/12/2009	19:37	CST-6	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
EUTAW	GREENE CO.	AL	12/08/2009	23:50	CST-6	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
UNION	GREENE CO.	AL	08/15/2010	20:05	CST-6	Thunderstorm Wind	55 kts. EG	0	0	7.00K	0.00K
EUTAW	GREENE CO.	AL	08/15/2010	20:15	CST-6	Thunderstorm Wind	60 kts. EG	0	0	6.00K	0.00K
MANTUA	GREENE CO.	AL	04/27/2011	03:43	CST-6	Thunderstorm Wind	60 kts. EG	0	0	15.00K	0.00K
UNION	GREENE CO.	AL	04/27/2011	03:50	CST-6	Thunderstorm Wind	60 kts. EG	0	0	15.00K	0.00K

GREENE CO.	GREENE CO.	AL	06/28/2011	12:16	CST-6	Thunderstorm Wind	40 kts. EG	0	0	0.50K	0.00K
MT HEBRON	GREENE CO.	AL	04/05/2012	09:12	CST-6	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
EUTAW	GREENE CO.	AL	09/03/2012	20:10	CST-6	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
WEST GREENE	GREENE CO.	AL	12/25/2012	17:00	CST-6	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
CLINTON	GREENE CO.	AL	12/25/2012	17:04	CST-6	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
EUTAW	GREENE CO.	AL	03/23/2013	21:04	CST-6	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
ALLISON	GREENE CO.	AL	06/28/2013	10:10	CST-6	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
EUTAW	GREENE CO.	AL	06/28/2013	10:12	CST-6	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
EUTAW	GREENE CO.	AL	06/28/2013	18:04	CST-6	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
Totals:								0	0	298.50K	1.600M

1 Straight-line Thunderstorm Wind Event – 01/01/2003 thru 12/31/2013 (4018 days)
(Source: Local Input)

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Ini</u>	<u>PrD</u>	<u>CrD</u>
EUTAW	GREENE CO.	AL	04/00/2004			Thunderstorm Straight-line Wind		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

0 Lightning Events – 01/01/2003 thru 12/31/2013 (4018 days)
(Source: NOAA NCDC Storm Events Database)

No lightning events occurred or were reported during 01/01/2003 thru 12/31/2013.

27 Hail Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
FORKLAND	GREENE CO.	AL	04/06/2003	15:29	CST	Hail	1.00 in.	0	0	0.00K	0.00K
CLINTON	GREENE CO.	AL	04/25/2003	11:34	CST	Hail	1.00 in.	0	0	3.00K	0.00K
EUTAW	GREENE CO.	AL	04/25/2003	12:20	CST	Hail	0.75 in.	0	0	0.00K	0.00K
MANTUA	GREENE CO.	AL	05/02/2003	14:54	CST	Hail	1.75 in.	0	0	25.00K	0.00K
EUTAW	GREENE CO.	AL	05/02/2003	15:20	CST	Hail	1.75 in.	0	0	70.00K	0.00K
CLINTON	GREENE CO.	AL	02/05/2004	18:08	CST	Hail	0.75 in.	0	0	0.00K	0.00K
CLINTON	GREENE CO.	AL	02/05/2004	19:00	CST	Hail	1.00 in.	0	0	0.00K	0.00K
CLINTON	GREENE CO.	AL	04/07/2004	17:42	CST	Hail	1.00 in.	0	0	0.00K	0.00K
BOLIGEE	GREENE CO.	AL	04/10/2004	16:15	CST	Hail	2.50 in.	0	0	30.00K	0.00K
MANTUA	GREENE CO.	AL	03/13/2005	18:48	CST	Hail	0.75 in.	0	0	0.00K	0.00K
EUTAW	GREENE CO.	AL	03/13/2005	20:04	CST	Hail	0.88 in.	0	0	0.00K	0.00K
BOLIGEE	GREENE CO.	AL	03/13/2005	20:05	CST	Hail	0.88 in.	0	0	0.00K	0.00K
EUTAW	GREENE CO.	AL	03/22/2005	08:39	CST	Hail	0.75 in.	0	0	0.00K	0.00K
BOLIGEE	GREENE CO.	AL	03/31/2005	02:29	CST	Hail	0.75 in.	0	0	0.00K	0.00K
EUTAW	GREENE CO.	AL	04/06/2005	13:12	CST	Hail	0.75 in.	0	0	1.00K	0.00K
FORKLAND	GREENE CO.	AL	04/22/2005	12:12	CST	Hail	0.75 in.	0	0	1.00K	0.00K
FORKLAND	GREENE CO.	AL	04/22/2005	17:22	CST	Hail	1.00 in.	0	0	1.00K	0.00K
UNION	GREENE CO.	AL	04/08/2006	00:34	CST	Hail	1.00 in.	0	0	0.00K	0.00K
BOLIGEE	GREENE CO.	AL	02/13/2007	16:23	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
CLINTON	GREENE CO.	AL	03/01/2007	14:30	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
UNION	GREENE CO.	AL	03/01/2007	15:24	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K

SNODDY	GREENE CO.	AL	10/18/2007	16:03	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
KNOXVILLE	GREENE CO.	AL	02/27/2009	15:41	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
BRAGGVILLE	GREENE CO.	AL	05/21/2010	13:25	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
KNOXVILLE	GREENE CO.	AL	03/27/2011	05:48	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
FORKLAND	GREENE CO.	AL	03/23/2013	18:16	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
FORKLAND	GREENE CO.	AL	03/23/2013	18:18	CST-6	Hail	1.50 in.	0	0	0.00K	0.00K
Totals:								0	0	131.00K	0.00K

9 Tornado Events – 01/01/2003 thru 12/31/2013 (4018 days)
(Source: NOAA NCDC Storm Events Database)

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
FORKLAND	GREENE CO.	AL	04/25/2003	13:25	CST	Tornado	F0	0	0	100.00K	0.00K
UNION	GREENE CO.	AL	09/25/2005	14:54	CST	Tornado	F0	0	0	0.00K	0.00K
CLINTON	GREENE CO.	AL	09/25/2005	16:37	CST	Tornado	F1	0	0	250.00K	0.00K
EUTAW	GREENE CO.	AL	03/04/2008	00:49	CST-6	Tornado	EF1	0	0	150.00K	0.00K
FORKLAND	GREENE CO.	AL	04/24/2010	10:22	CST-6	Tornado	EF1	0	2	50.00K	0.00K
KNOXVILLE	GREENE CO.	AL	04/15/2011	14:14	CST-6	Tornado	EF1	0	0	83.80K	0.00K
FORKLAND	GREENE CO.	AL	04/15/2011	15:44	CST-6	Tornado	EF1	0	0	371.00K	0.00K
MANTUA	GREENE CO.	AL	04/27/2011	15:43	CST-6	Tornado	EF2	0	0	2.500M	0.00K
TISHABEE	GREENE CO.	AL	04/27/2011	16:30	CST-6	Tornado	EF2	0	0	5.000M	0.00K
Totals:								0	2	8.505M	0.00K

10 Flood/Flash Flood Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
GREENE (ZONE)	GREENE (ZONE)	AL	04/01/2005	00:00	CST	Flood		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/06/2005	00:00	CST	Flood		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	06/12/2005	06:45	CST	Flood		0	0	20.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	07/11/2005	00:00	CST	Flood		0	0	3.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	04/07/2003	05:00	CST	Flash Flood		0	0	10.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	02/05/2004	21:30	CST	Flash Flood		0	0	0.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	02/06/2004	00:10	CST	Flash Flood		0	0	5.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	07/10/2005	18:00	CST	Flash Flood		0	0	15.00K	0.00K
SNODDY	GREENE CO.	AL	09/21/2009	05:30	CST-6	Flash Flood		0	0	20.00K	0.00K
WEST GREENE	GREENE CO.	AL	09/05/2011	11:00	CST-6	Flash Flood		0	0	0.00K	0.00K
Totals:								0	0	73.00K	0.00K

15 Drought/Extreme Heat Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
GREENE (ZONE)	GREENE (ZONE)	AL	07/18/2006	07:00	CST	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/01/2006	00:00	CST	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/01/2006	00:00	CST	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	03/27/2007	06:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	05/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	06/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	07/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	10/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	11/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	12/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	01/01/2008	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	02/01/2008	00:00	CST-6	Drought		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

7 Winter Storm/Frost Freeze/Heavy Snow/Ice Storm/Winter Weather/Extreme Cold Events –
01/01/2003 thru 12/31/2013 (4018 days)
(Source: NOAA NCDC Storm Events Database)

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
GREENE (ZONE)	GREENE (ZONE)	AL	01/09/2011	11:15	CST-6	Ice Storm		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	01/19/2008	06:00	CST-6	Winter Weather		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	02/12/2010	11:00	CST-6	Winter Weather		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	02/09/2011	17:15	CST-6	Winter Weather		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	01/24/2003	00:00	CST	Extreme Cold/wind Chill		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/07/2007	00:00	CST-6	Frost/freeze		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/08/2007	00:00	CST-6	Frost/freeze		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

8 Hurricane/Tropical Storm/Tropical Depression/High Wind/Strong Wind Events –
01/01/2003 thru 12/31/2013 (4018 days)
(Source: NOAA NCDC Storm Events Database)

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
GREENE (ZONE)	GREENE (ZONE)	AL	07/10/2005	15:00	CST	Tropical Storm		0	0	165.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/29/2005	17:00	CST	Tropical Storm		0	0	1.800M	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/23/2008	12:00	CST-6	Tropical Depression		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	11/09/2009	14:00	CST-6	Tropical Depression		0	0	1.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/16/2004	06:00	CST	High Wind	77 kts. EG	0	0	5.000M	75.00K
GREENE (ZONE)	GREENE (ZONE)	AL	06/11/2005	14:00	CST	Strong Wind	40 kts. EG	0	0	5.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	03/28/2009	05:30	CST-6	Strong Wind	35 kts. EG	0	0	5.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/05/2011	15:10	CST-6	Strong Wind	39 kts. EG	0	0	8.00K	0.00K
Totals:								0	0	6.984M	75.00K

0 Sinkhole Events – 01/01/2003 thru 12/31/2013 (4018 days)
(Source: NOAA NCDC Storm Events Database/U.S. Geological Survey)

No sinkhole events occurred or were reported during 01/01/2003 thru 12/31/2013.

0 Landslide Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database/U.S. Geological Survey)

No landslide events occurred or were reported during 01/01/2003 thru 12/31/2013.

3 Earthquake Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: Homefacts.com; City-data.com; and U.S. Geological Survey)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
FORKLAND /BRAGGVILLE	GREENE COUNTY	AL	11/07/2004	11:20 a	CST	Earthquake	4.3-4.4 Mag/5 km depth	0	0	0.00K	0.00K
MT. HEBRON/BOLIGEE	GREENE COUNTY	AL	05/16/2006		CST	Earthquake	2.5 Mag	0	0	0.00K	0.00K
UNION	GREENE COUNTY	AL	03/09/2004		CST	Earthquake	2.6 Mag	0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

No earthquake events were reported to NOAA NCDC during 01/01/2003 thru 12/31/2013.

54 Wildfire Events – 1/1/2010 thru 12/31/2013

(Source: Alabama Forestry Commission)

County	Total # of Fires 2010-2013	Average # of Fires Per Year	Total Acres Burned 2010-2013	Average Acres Burned Per Year	Average Fire Size in Acres
Greene	54	18	604.40	201	11

0 Dam/Levee Failure Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database/Local Input)

No dam/levee failure events occurred or were reported during 01/01/2003 thru 12/31/2013.

Hazard Profiles

I. Thunderstorms

A thunderstorm is a convective cloud that often produces heavy rain, wind gusts, thunder, lightning, and hail. Greene County experiences many thunderstorms each year. The county is most susceptible to thunderstorms during the spring, summer, and late fall. Most of the damage caused by thunderstorms results from straight-line winds, lightning, flash flooding, and hail. Occasionally, thunderstorms will spawn tornados.

Primary Effects from thunderstorms in Greene County would include:

1. High Winds, Straight-line Winds
2. Lightning
3. Flooding
4. Hail
5. Spawning Tornados

Hazardous results from significant thunderstorms in Greene County would include:

1. High winds can cause downed trees and electrical lines resulting in loss of power.
2. Severe storms are capable of producing intense lightning that poses many threats to people and infrastructure and can ignite fires.
3. Heavy rains can produce severe storm water run-off in developed areas, and cause bodies of water to breach their banks.
4. Large hail can injure people and livestock and damage crops.
5. Severe thunderstorms can produce tornados that destroy anything in their path, resulting in loss of power, shelter, and potential loss of life.

Table 3-5 shows the historical occurrences of thunderstorms during the study period. Each jurisdiction is at risk for thunderstorm events. Of the thunderstorms reported, one affected the entire county, one affected the western portion of the county, six occurred in an unincorporated county area, and the remaining 21 affected only specific municipalities.

Greene County experienced 29 thunderstorm events in a 10 year period resulting in a greater than 100% (2.90) probability that a thunderstorm event will occur on an annual basis. The total amount of damages for the 29 thunderstorm events was \$1,898,500 with 20 thunderstorm events causing damage resulting in an estimated \$94,925 of expected annual damages from future

events. The extent/range of magnitude or severity that could be experienced by Greene County due to a thunderstorm event is minor to major.

II. Lightning

Lightning is a natural phenomenon associated with all thunderstorms but can occur in the absence of a storm. Lightning typically occurs as a by-product of a thunderstorm. Each jurisdiction is at risk for lightning events. Lightning strikes can cause power outages, fires, electrocution, and disruptions to communication systems. The NOAA NCDC reported no lightning events during the ten-year study period of 2003-2013. Since no lightning events were reported, no property damages, crop damages, injuries, or deaths were reported as results of lightning events. **Table 3-5** shows the historical occurrences of lightning during the study period. The State of Alabama has experienced 11-20 deaths as a result of lightning strikes during 2003 – 2013.

The action of rising and descending air in a thunderstorm separates positive and negative charges, with lightning the result of the buildup and discharge of energy between positive and negative charge areas.

Water and ice particles may also affect the distribution of the electrical charge. In only a few millionths of a second, the air near a lightning strike is heated to 50,000°F, a temperature hotter than the surface of the sun. Thunder is the result of the very rapid heating and cooling of air near the lightning that causes a shock wave.

The hazard posed by lightning is significantly underrated. High winds, rainfall, and a darkening cloud cover are the warning signs for possible cloud-to-ground lightning strikes. While many lightning casualties happen at the beginning of an approaching storm, more than half of lightning deaths occur after a thunderstorm has passed. The lightning threat diminishes after the last sound of thunder, but may persist for more than 30 minutes. When thunderstorms are in the area, but not overhead, the lightning threat can exist when skies are clear. Lightning has been known to strike more than 10 miles from the storm in an area with clear sky above.

According to the National Oceanic and Atmospheric Administration (NOAA), an average of 20 million cloud-to-ground flashes has been detected every year in the continental United States. About half of all flashes have more than one ground strike point, so at least 30 million points on the ground is struck on the average each year. In addition, there are roughly 5 to 10 times as many cloud-to-cloud flashes as there are to cloud-to-ground flashes (NOAA, July 7, 2003).

Cloud-to-ground lightning can kill or injure people by either direct or indirect means. The lightning current can branch off to strike a person from a tree, fence, pole, or other tall object. It is not known if all people are killed who are directly struck by the flash itself. In addition, electrical

current may be conducted through the ground to a person after lightning strikes a nearby tree, antenna, or other tall object. The current also may travel through power lines, telephone lines, or plumbing pipes to a person who is in contact with an electric appliance, telephone, or plumbing fixture. Lightning may use similar processes to damage property or cause fires.

Greene County experienced 0 lightning events in a 10 year period resulting in a 0% (0.00) probability that a lightning event will occur on an annual basis. The total amount of damages for the 0 lightning events was \$0.00 with 0 lightning events causing damage resulting in an estimated \$0 of expected annual damages from future events. The extent/range of magnitude or severity that could be experienced by Greene County due to a lightning event is minimum to minor.

Primary effects from lightning in Greene County would include:

1. Power Outages
2. Wild Fires
3. Electrocution
4. Disruption of Communication Waves

Hazardous results from significant lightning in Greene County would include:

1. Power outages result in tremendous losses for food distributors and individuals due to loss of refrigeration as well as disruptions to routine business operations.
2. Fires destroy most everything it comes in contact with and also can be detrimental to the health of any living organism due to the massive smoke cloud it produces.
3. Electrocution of electronic device such as water and sewer pumps can cause disruption in service leading to unsanitary conditions and lack of potable water.
4. Disrupted communications from electrical storms can result in inability to communicate with other agencies, making preparation or recovery from a storm nearly impossible.

III. Hail

Hail is frequently associated with severe thunderstorms. Hail is an outgrowth of severe thunderstorms and develops within a low-pressure front as warm air rises rapidly in to the upper atmosphere and is subsequently cooled, leading to the formation of ice crystals. These are bounced about by high-velocity updraft winds and accumulate into frozen droplets, falling as precipitation after developing enough weight (FEMA, 1997).

The National Weather Service (NWS) defines severe thunderstorms as those with downdraft winds in excess of 58 miles an hour and/or hail at least 3/4 inches in diameter. While only about 10 percent of thunderstorms are classified as severe, all thunderstorms are dangerous because they produce numerous dangerous conditions, including one or more of the following: hail, strong winds, lightning, tornadoes, and flash flooding (National Weather Service – Flagstaff). The size of hailstones varies and is related to the severity and size of the thunderstorm that produced it. The higher the temperatures at the Earth's surface, the greater the strength of the updrafts, and the greater the amount of time the hailstones are suspended, giving the hailstones more time to increase in size. Hailstones vary widely in size, as shown in **Table 3-6**. Note that penny size (3/4 inches in diameter) or larger hail is considered severe.

Table 3-5: Estimating Hail Size

Size	Inches in Diameter
Pea	1/4 inch
Marble/mothball	1/2 inch
Dime/Penny	3/4 inch
Nickel	7/8 inch
Quarter	1 inch
Ping-Pong Ball	1 1/2 inch
Golf Ball	1 3/4 inch
Tennis Ball	2 1/2 inch
Baseball	2 3/4 inch
Tea Cup	3 inches
Grapefruit	4 inches
Softball	4 1/2 inches
<i>Source: NWS, January 10, 2003</i>	

Hailstorms occur most frequently during the late spring and early summer, when the jet stream moves northward across the Great Plains. During this period, extreme temperature changes occur from the surface up to the jet stream, resulting in the strong updrafts required for hail formation.

The NOAA NCDC reported 27 hail events during the ten-year study period of 2003-2013. An estimated \$131,000 in property damage resulted from these events. No crop damage, injuries, or deaths were reported during these hail events. **Table 3-5** shows the historical occurrences of hail events during the study period. Each jurisdiction is at risk for hail. Of the events reported, zero affected the entire county, six occurred in an unincorporated county area, and the remaining 21 affected only specific municipalities.

Greene County experienced 27 hail events in a 10 year period resulting in a greater than 100% (2.70) probability that a hail event will occur on an annual basis. The total amount of damages for the 27 hail events was \$131,000 with 7 hail events causing damage resulting in an estimated \$18,714 of expected annual damages from future events. The extent/range of magnitude or severity that could be experienced by Greene County due to a hail event is minor to major.

Primary Effects from Hail in Greene County would include:

1. Property Damage
2. Crop Damage
3. Communication equipment damage
4. Livestock loss and injury

Hazardous results from significant Hail in Greene County would include:

1. Any size hail can damage exposed real and personal property. Hail is a major problem for car dealerships, as the unprotected lots of cars receive major damage.
2. Heavy hail is capable of destroying entire crop yields. Farmers of above ground crops are especially concerned with hail as it is extremely detrimental to the crop.
3. Communication equipment, such as receivers, is susceptible to large hail. These instruments can be seriously damaged or destroyed by large hail.
4. Large hail is a danger to livestock of all sorts and is a threat farmers must consider. Hundreds of thousands of dollars are invested in these animals which

may be injured or killed in a hailstorm.

IV. Tornado

Tornados are rotating columns of air extending downward to the ground with recorded winds in excess of 300 miles per hour. They are highly localized events, most of which last for a short period of time and have a limited destruction path. In Alabama the typical tornado season extends from March through early June, with April and June being peak months for tornado activity. Additionally, Alabama experiences a secondary tornado season from November through December. **Figure 3-1** shows the general paths of tornados across the United States.

Figure 3-2 shows the FEMA designated wind zones in the United States. Greene County is located in Zone IV, which warrants profiling. Zone IV has witnessed a higher frequency of tornados than any other zone. Zone IV has also witnessed some of the deadliest tornados in history.

Nine tornados have occurred in Greene County according to the National Weather Service Archives. Two injuries and no deaths were reported as a result of these events. An estimated \$8,505,000 in property damage and no crop damage occurred as a result of these tornados. The most significant event took place in the unincorporated area of Tishabee in April of 2011. The EF2 tornado caused \$5,000,000 in property damage.

Greene County experienced 9 tornado events in a 10 year period resulting in a less than 100% (.90) probability that a tornado event will occur on an annual basis. The total amount of damages for the 9 tornado events was \$8,505,000 with 8 tornado events causing damage resulting in an estimated \$1,063,125 of expected annual damages from future events. Two injuries resulted from one tornado event resulting in \$43,350 injury dollar amount. The extent/range of magnitude or severity that could be experienced by Greene County due to a tornado event is major.

Primary effects from tornados in Greene County would include:

1. Loss of life
2. Property damage
3. Infrastructure destruction and damage
4. Sanitation and water delivery interruption

Hazardous results from significant tornados in Greene County would include:

1. Collapse of structures can leave people homeless.
2. Roadways may become blocked by debris. Damage may destroy automobiles,

creating additional hardships to individuals and families and business operations.

3. High wind speeds associated with a tornado can destroy anything in its path. Power poles topple, communication receivers are destroyed, and water sanitation and treatment plants are offline.
4. Due to destruction, sanitation crews are unable to remove massive amounts of waste, and water delivery is disrupted. This can lead to an increase in disease-carrying insects and lack of potable water.

Figure 3-1: Generalized Tornado Paths

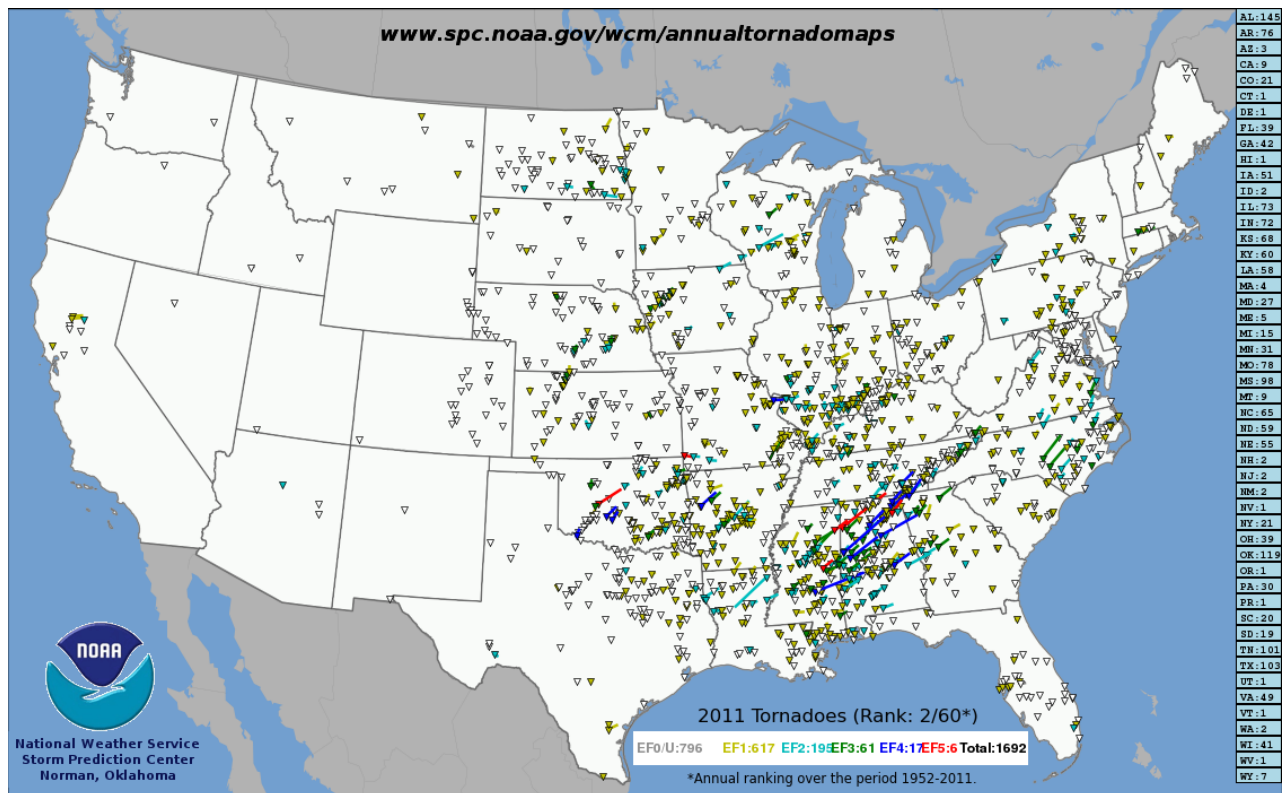


Figure 3-2: Wind Zones in the United States

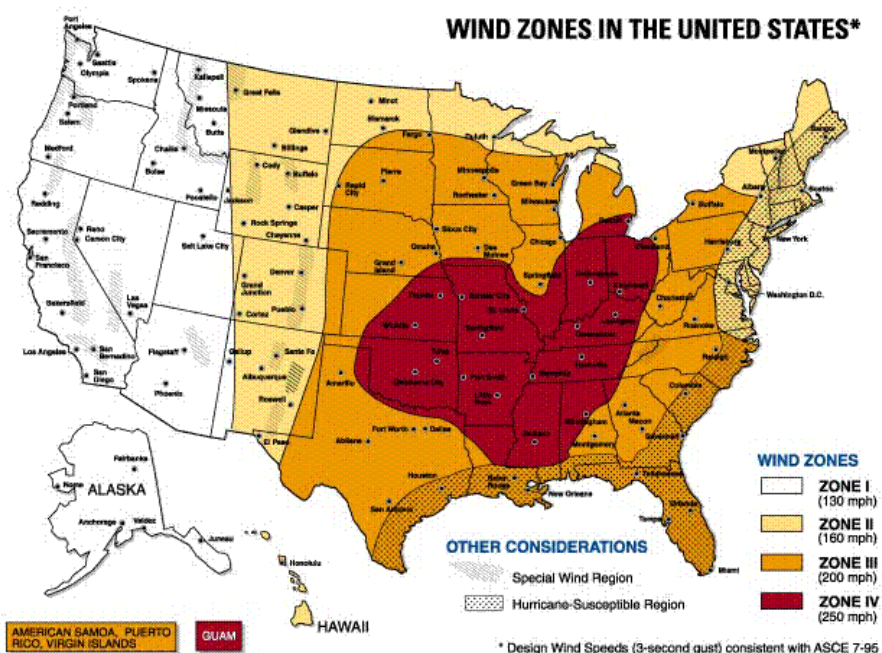


Figure I.2 Wind zones in the United States
Source: www.fema.gov

Tornados are now measured using the new enhanced Fujita Tornado Scale by examining the damage caused by the tornado after it passes over man-made structures and vegetation. The new scale was put into use in February of 2007. Due to the study period of the plan, this goes from 2003-2013, events shown in Table 3-5 express the magnitude of tornados using the original Fujita scale and the enhanced Fujita scale. Below is a table comparing the estimated winds in the original F-scale and the operational EF-scale that is currently in use by the National Weather Service. Like the original scale there are six categories from zero to five that represent damage in increasing degrees. The new scale incorporates the use of 28 Damage Indicators and 8 Degrees of Damage to assign a rating.

Table 3-6: Fujita Tornado Scales

Fujita Tornado Scale

Category	Wind Speed	Description of Damage
F0	40-72 mph	Light damage. Some damage to chimneys; break branches off trees; push over shallow-rooted trees; damage to sign boards.
F1	73-112 mph	Moderate damage. The lower limit is the beginning of hurricane speed. Roof surfaces peeled off; mobile homes pushed off foundations or overturned; moving autos pushed off roads.
F2	113-157 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.
F3	158-206 mph	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; cars lifted off ground and thrown.
F4	207-260 mph	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	261-318 mph	Incredible damage. Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 100-yards; trees debarked.

Source: FEMA, 1997.

Enhanced Fujita Tornado Scale

Category	Wind Speed	Description of Damage
EF0	65-85 mph	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	86-110 mph	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135 mph	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136-165 mph	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166-200 mph	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	>200 mph	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd); high-rise buildings have significant structural deformation; incredible phenomena will occur. So far only one EF5 tornado has been recorded since the Enhanced Fujita Scale was introduced on February 1, 2007.

Source: NOAA, NWS, Storm Prediction Center, 2007.

V. Flood/Flash Flood

There are three types of flooding that affect Greene County: (1) general flooding, (2) storm water runoff, and (3) flash flooding. General flooding occurs in areas where development has encroached into flood-prone areas. Storm water runoff causes flooding in areas that have inadequate drainage systems. Flash flooding is caused when a large amount of rain falls within a short period of time. **Table 3-5** shows severe flooding events in Greene County recorded by NOAA NCDC. Between 2003 and 2013 there were four occurrences of general flooding and six instances of flash flooding in the county. Damages resulted in the amount of \$73,000 in property damage and no crop damages. No deaths or injuries were reported.

Flash floods involve a rapid rise in water level, high velocity, and large amounts of debris, which can lead to significant damage that includes the tearing out of trees, undermining of buildings and bridges, and scouring new channels. The intensity of flash flooding is a function of the intensity and duration of rainfall, steepness of the watershed, stream gradients, watershed vegetation, natural and artificial flood storage areas, and configuration of the streambed and floodplain. Dam failure and ice jams may also lead to flash flooding.

Dam-break floods may occur due to structural failures (e.g., progressive erosion), overtopping or breach from flooding, or earthquakes. Dam failures are potentially the worst flood events. Dam safety has been an ongoing hazard mitigation issue in the State of Alabama for the past decade, especially for small dams that are privately owned and poorly maintained. No state law currently exists to regulate any private dams or the construction of new private dams, nor do private dams require federal licenses or inspections. There have been several attempts in the State of Alabama to pass legislation that would require inspection of dams on bodies of water over 50 acre-feet or dams higher than 25 feet. Enactment has been hampered by the opposition of agricultural interest groups and insurance companies. Approximately 1,700 privately owned dams would fit into the category proposed by the law.

According to *HAZUS MH 2.1*, Greene County has 69 High Density Polyethylene (HPDE - Earth) Dams, including one high hazard dam (Howell Heflin Lock and Dam), 3 significant risk dams, and 65 low risk dams. No historical records are available of dam/levee failures in Greene County. When a dam fails, a large quantity of water is suddenly released downstream, destroying anything in its path. The area impacted by the water emitted by dam failure would encounter the same risks as those in a flood zone during periods of flooding. The area directly affected by the

water released during a dam failure is not county wide.

The probability of future occurrences of dam/levee failure events cannot be characterized on a countywide basis because of the lack of information available. The qualitative probability is rated low because the overall area affected is low and impacts are localized. This rating is intended only for general comparison to other hazards that are being considered.

Local drainage floods may occur outside of recognized drainage channels or delineated flood plains for a variety of reasons, including concentrated local precipitation, a lack of infiltration, inadequate facilities for drainage and storm water conveyance, and/or increased surface runoff. Such events often occur in flat areas, particularly during winter and spring in areas with frozen ground, and also in urbanized areas with large impermeable surfaces. High groundwater flooding is a seasonal occurrence in some areas, but may occur in other areas after prolonged periods of above-average precipitation.

Floods are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and the related probability of occurrence. Flood studies use historical records to determine the probability of occurrence for different extents of flooding. The probability of occurrence is expressed in percentages as the chance of a flood of a specific extent occurring in any given year. It is also often referred to as the “100-year flood” since its probability of occurrence suggests it should only occur once every 100 years. This expression is, however, merely a simple and general way to express the statistical likelihood of a flood; actual recurrence periods are variable from place to place. Smaller floods occur more often than larger (deeper and more widespread) floods. Thus, a “10-year” flood has a greater likelihood of occurring than a “100-year” flood. **Table 3-8** shows a range of flood recurrence intervals and their probabilities of occurrence.

Table 3-7: Flood Probability Terms	
Flood Recurrence Intervals	Percent Chance of Annual Occurrence
10-Year	10.0%
50-Year	2.0%
100-Year	1.0%
500-Year	0.2%
<i>(Source: FEMA, August 2001)</i>	

Greene County experienced 10 flood/flash flood events in a 10 year period resulting in a 100% (1.00) probability that a flood/flash flood event will occur on an annual basis. The total amount of damages for the 10 flood/flash flood events was \$73,000 with 6 flood/flash flood events causing damage resulting in an estimated \$12,167 of expected annual damages from future events. The extent/range of magnitude or severity that could be experienced by Greene County due to a flood/flash flood event is minor to major.

Primary Effects from Floods in Greene County would include:

1. Loss of life
2. Property damage
3. Crop damage
4. Dam and levee failure

Hazardous results from significant flood in Greene County would include:

1. Rising water levels can quickly sweep people along in its path.
2. Rapidly moving water destroys anything in its path and also leaves hazardous mold and breeds insects.
3. Periods of standing water kill inadaptible plants, and flowing water removes sediment and nutrients from the soil.
4. Breached dams and levees allow water to flood into the surrounding floodplain resulting in destruction of crops and property.

Dam failures may result from one or more the following:

1. Prolonged periods of rainfall and flooding (the cause of most failures)
2. Inadequate spillway capacity which causes excess overtopping flows
3. Internal erosion erosions due to embankment or foundation leakage or piping
4. Improper maintenance
5. Improper design
6. Negligent operation
7. Failure of upstream dams
8. Landslides into reservoirs
9. High winds
10. Earthquakes

Flood Assessment Tools

Programs

Greene County participates in the *National Flood Insurance Program (NFIP)*. The *NFIP* allows property owners to purchase federally sponsored flood insurance. The *NFIP* maps communities in order to establish Flood Risk Zones or Special Flood Hazards Areas. These hazard areas are then mapped on the *Flood Insurance Rate Maps (FIRMS)*. *FIRMS* are used to assess the risks of floods and aid in proper floodplain management. An update of the Greene County flood maps was completed in 2010. Greene County, the City of Boligee, and the City of Eutaw participate in the NFIP. The Towns of Forkland and Union are now mapped; however, they are not NFIP participates. The National Flood Insurance Program (NFIP) requires local participation. **Table 3-9** shows the current NFIP status of each jurisdiction.

Flood Mitigation Assistance Program (FMA) - This program now allows for additional cost share flexibility: up to 100% federal cost share for severe repetitive loss properties; up to 90% federal costs share for repetitive loss properties; and 75% federal cost share for NFIP insured properties.

The Repetitive Flood Claims (RFC) and Severe Repetitive Loss (SRL) Grant Programs were eliminated by the Biggert-Waters Flood Insurance Reform Act of 2012. Elements of these flood grant programs have been incorporated into FMA.

Regulations

The *National Pollutant Discharge Elimination System (NPDES)* requires cities to obtain a NPDES permit for the discharge of wastewater/storm water. This program will address residential and commercial land uses, illicit discharges and improper disposal, industrial facilities, and construction sites. Currently, only the City of Eutaw has a Storm Water Management Plan.

Additionally, Greene County and each jurisdiction have various plans and regulatory tools in place to aid in hazard mitigation as shown earlier in the plan in **Table 1-1**.

Table 3-8: Greene County National Flood Insurance Program Status by Jurisdiction						
CID	Community Name	Initial FHB Identified	Initial FIRM Identified	Current Eff. Map Date	Sanction Date	Tribal
010091#	Greene County	01/28/77	04/16/90	08/05/10	04/16/90	No
010092#	City of Boligee	12/13/74	08/05/10	08/05/10	08/07/12	No
010093#	City of Eutaw	11/08/74	08/19/85	08/05/10 (M - no elevation determined – All Zone A, C, and X)	08/19/85	No
010514#	Town of Forkland	-	08/05/10	08/05/10	08/05/11	No
010515#	Town of Union	-	08/05/10	08/05/10	08/05/11	No
<i>Source: FEMA Community Status Book Report as of February 6, 2014</i>						

Repetitive Loss Properties

Repetitive loss properties are those for which two or more losses of at least \$1,000 each have been paid under the National Flood Insurance Program (NFIP) within any 10-year period. *FEMA – Local Multi-Hazard Mitigation Planning Guidance, July 1, 2008.*

Greene County currently has no Severe Repetitive Loss Properties at this time.

Flood Prone Areas

Greene County is almost completely surrounded by major rivers; the Alabama-Tombigbee, Black Warrior, and Sipsey. Significant flood zone areas accompany these rivers and many of their associated creeks and streams. Those primary creeks with mapped flood zones include Brush Creek, Trussells Creek, Taylor Creek, Needham Creek, Minter Creek and Sims Creek. Flood prone areas are located primarily along the rivers and affect camp houses and vacation properties. All of the repetitive loss properties in the county are located along either the Tombigbee or Black Warrior Rivers.

VI. Drought/Extreme Heat

Drought occurs when there is a deficiency of precipitation over an extended period of time. Climatic factors, such as high temperature, high winds, and low relative humidity, can contribute to the severity of a drought. No society is immune to the social, economic, and environmental impacts of a drought. There are two primary types of drought: meteorological and hydrological droughts. These events can result in agricultural and socioeconomic droughts.

Meteorological droughts are defined as the degree of dryness as compared to the normal precipitation for the area over the duration of the dry season. This type of drought is specific to a given region since atmospheric conditions and precipitation vary from one region to another.

Hydrological droughts are associated with the effects of precipitation deficiencies on surface or groundwater supplies. Hydrological droughts do not occur as often as meteorological or agricultural droughts. It takes longer for precipitation deficiencies to show up in soil moisture, stream flow, groundwater levels, and reservoir levels. Hydrological droughts have an immediate impact on crop production, but reservoirs may not be affected for several months. Climate, changes in land use, land degradation, and the construction of dams can have adverse effects on the hydrological system especially in drought conditions.

Agricultural droughts occur when the moisture in the soil no longer meets the needs of the crops.

Socioeconomic droughts occur when physical water shortage begins to affect people and their quality of life.

A drought's severity depends on numerous factors, including duration, intensity, and geographic extent as well as regional water supply demands by humans and vegetation. Due to its multidimensional nature, drought is difficult to define in exact terms and also poses difficulties in terms of comprehensive risk assessments.

Drought differs from other natural hazards in three ways. First, the onset and end of a drought are difficult to determine due to the slow accumulation and lingering of effects of an event after its apparent end. Second, the lack of an exact and universally accepted definition adds to the confusion of its existence and severity. Third, in contrast with other natural hazards, the impact of drought is less obvious and may be spread over a larger geographic area. These characteristics have hindered the preparation of drought contingency or mitigation plans by

many governments.

Droughts may cause a shortage of water for human and industrial consumption, hydroelectric power, recreation, and navigation. Water quality may also decline and the number and severity of wildfires may increase. Severe droughts may result in the loss of agricultural crops and forest products, undernourished wildlife and livestock, lower land values, and higher unemployment.

Extreme summer heat is the combination of very high temperatures and exceptionally humid conditions. If such conditions persist for an extended period of time, it is called a heat wave (FEMA, 1997). Heat stress can be indexed by combining the effects of temperature and humidity, as shown in **Table 3-10**. The index estimates the relationship between dry bulb temperatures (at different humidity) and the skin's resistance to heat and moisture transfer - the higher the temperature or humidity, the higher the apparent temperature.

In addition to affecting people, severe heat places significant stress on plants and animals. The effects of severe heat on agricultural products, such as cotton, may include reduced yields and even loss of crops (Brown and Zeiher, 1997). Similarly, cows may become overheated, leading to reduced milk production and other problems. (Garcia, September 2002).

Drought is a natural event that, unlike floods or tornadoes, does not occur in a violent burst but gradually happens; furthermore, the duration and extent of drought conditions are unknown because rainfall is unpredictable in amount, duration and location. Drought events can potentially affect the entire county.

The Draft Alabama Drought Management Plan (DMP), developed by the Alabama Department of Economic and Community Affairs – Office of Water Resources (ADECA-OWR), defines drought in terms of several indices that describe the relative amounts of surface water flow, groundwater levels, and recent precipitation as compared to localized norms. Because drought is defined in relative terms, it can be stated that all areas of the county are susceptible to drought.

The National Weather Service uses two indexes to categorize drought. The most accurate index of short-term drought is the Crop Moisture Index (CMI). This index is effective in determining short-term dryness or wetness affecting agriculture. The most accurate index of long-term drought is the Palmer Index (PI). It has become the semi-official index of drought.

Greene County experienced 15 drought/extreme heat events in a 10 year period resulting

in a greater than 100% (1.50) probability that a drought/extreme heat event will occur on an annual basis. The total amount of damages for the 15 drought/extreme heat events was \$0 with no drought/extreme heat events causing damage resulting in an estimated \$0 of expected annual damages from future events. The extent/range of magnitude or severity that could be experienced by Greene County due to a drought/extreme heat event is minimum to minor.

Primary effects from Drought and Excessive Heat in Greene County would include:

1. Crop and other agricultural damage
2. Water supply shortage. Water wells, creeks, rivers, and lakes dry up
3. Forest fires
4. Heat exhaustion and heat stroke

Hazardous results from significant Drought and Excessive Heat in Greene County would include:

1. Agricultural damage from drought will result in economic losses of crops and livestock.
2. A water supply shortage will result in the necessity for water to be trucked into the area, damage to the sewer system and lack of hydroelectric power.
3. Forest fires can devastate vast acreages and burn homes and businesses.
4. Heat exhaustion can be debilitating and result in a hospital stay. Heat stroke can cause death.

Temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks are defined as extreme heat. Humid or muggy conditions occur when a “dome” of high atmospheric pressure traps hazy, damp air near the ground. The combination of high temperatures and humid conditions increase the level of discomfort and the potential for danger to humans. A sibling to the heat wave is the drought. Droughts occur when a long period passes without any substantial rainfall. A heat wave combined with a drought is a very dangerous situation.

The human risks associated with extreme heat include heatstroke, heat exhaustion, heat syncope, heat cramps. A description of each of these conditions follows:

- Heatstroke is considered a medical emergency and is often fatal. It exists when rectal temperature rises above 105°F as a result of environmental temperatures. Patients

may be delirious, stuporous, or comatose. The death to care ratio in reported cases averages about 15%.

- Heat Exhaustion is much less severe than heatstroke. The body temperature may be normal or slightly elevated. A person suffering from heat exhaustion may complain of dizziness, weakness or fatigue. The primary cause of heat exhaustion is fluid and electrolyte imbalance. The normalization of fluids will typically alleviate the situation.
- Heat Syncope is typically associated with exercise by people who are not acclimated to exercise. The symptom is a sudden loss of consciousness. Consciousness returns promptly when the person lies down. The cause is primarily associated with circulatory instability as a result of heat. The condition typically causes little or no harm to the individual.
- Heat Cramps are typically a problem for individuals who exercise outdoors but are unaccustomed to heat. Similar to heat exhaustion it is thought to be a result of a mild imbalance of fluids and electrolytes.

In 1979 R. G. Steadman, a meteorologist, developed the heat index, which is a relationship between dry bulb temperatures (at different humidity) and the skin's resistance to heat and moisture transfer. Utilizing Steadman's heat index, the following table was developed to show the risk associated with ranges in apparent temperature or heat index.

Table 3-9: Heat Index/Heat Disorders

Danger Category	Heat Disorder	Apparent Temperature (°F)
IV Extreme Danger	Heatstroke or sunstroke imminent.	>130
III Danger	Sunstroke, heat cramps, or heat exhaustion likely, heat stroke possible with prolonged exposure and physical activity.	105-130
II Extreme Caution	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and physical activity.	90-105
I Caution	Fatigue possible with prolonged exposure and physical activity.	80-90

(Source: National Weather Service, 1997)

Droughts and heat waves have a county-wide impact. The future incidence of drought is highly unpredictable, conditions may be localized or widespread, and not much historical data is available making it difficult to determine the future probability of drought conditions with any accuracy. The qualitative probability rating for drought is high.

Table 3-5 reflects that the NOAA NCDC reported 15 instances of drought for Greene County from 2003-2013. No crop or property damages were reported. There were no reports of extreme heat events during this ten year period.

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VII. Winter Storm/Frost Freeze/Heavy Snow/Ice Storm/Winter Weather/Extreme Cold

Greene County is vulnerable to extreme winter weather conditions such as extreme cold temperatures, snow, and ice. **Table 3-5** shows the winter storm/extreme cold/frost freeze/heavy snow/ice storm/winter weather events that have affected Greene County from 2003 - 2013.

The most common impacts of severe winter weather are power failure due to downed power lines and traffic hazards. Winter storm occurrences tend to be very disruptive to transportation and commerce as the county and its citizens are unaccustomed to them. Trees, cars, roads, and other surfaces develop a coating or glaze of ice, making even small accumulations of ice extremely hazardous to motorists and pedestrians. The most prevalent impacts of heavy accumulations of ice are slippery roads and walkways that lead to vehicle and pedestrian accidents; collapsed roofs from fallen trees and limbs and heavy ice and snow loads; and fallen trees, telephone poles and lines, electrical wires, and communication towers. As a result of severe ice storms, telecommunications and power can be disrupted for days. Also many homes and buildings, especially in rural areas, lack proper insulation or heating, leading to risk of hypothermia. Extremely cold temperatures accompanied by strong winds can result in wind chills that cause bodily injury such as frostbite and death.

Greene County experienced 7 winter storm/frost freeze/heavy snow/ice storm/winter weather/extreme cold events in a 10 year period resulting in a less than 100% (.70) probability that a winter storm/frost freeze/heavy snow/ice storm/winter weather/extreme cold event will occur on an annual basis. The total amount of damages for the 7 winter storm/frost freeze/heavy snow/ice storm/winter weather/extreme cold events was \$0 with no winter storm/frost freeze/heavy snow/ice storm/winter weather/extreme cold events causing damage resulting in an estimated \$0 of expected annual damages from future events. The extent/range of magnitude or severity that could be experienced by Greene County due to a winter storm/frost freeze/heavy snow/ice storm/winter weather/extreme cold event is minimum to minor.

Primary effects from winter storms in Greene County would include:

1. Injury and damage from downed trees and utility lines due to the snow and ice load.
2. Widespread impassable roads and bridges.

3. Disruption of services and response capabilities.
4. Crop and other agricultural damage.

Hazardous results from winter storms in Greene County would include:

1. Loss of power, communications, and fires are a common result of severe winter storms. Widespread power outages close down businesses and impact hospitals, nursing homes, and adult and child care facilities serving special needs populations.
2. Loss of transportation ability will affect emergency response, recovery and supply of food and materials.
3. Numerous vehicle accidents in a winter storm can stretch thin the resources of fire, rescue and law enforcement.
4. Stranded motorists and the homeless can create a food and housing shortage within the community.
5. The widespread nature of winter storms usually creates a strain on police, fire and medical providers due to the volume of calls for service.

VIII. Hurricane/Tropical Storm/Tropical Depression/High Wind/Strong Wind Profile

Hurricane season in the northern Atlantic Ocean, which affects the United States, begins on June 1 and ends on November 31. These months accompany warmer sea surface temperatures, which is a required element to produce the necessary environment for tropical cyclone/hurricane development.

NOAA measures wind speeds for thunderstorm/wind and hurricane events in knots (kts) while the Saffir-Simpson scale, shown later in the Hurricane profile, measures wind speed in miles per hour. Both knots and miles per hour is a speed measured by a number of units of distance covered in certain amount of time. Here is how knots compare to MPH:

- 1 knot = 1 nautical mile per hour = 6076.12 feet per hour
- 1 MPH = 1 mile per hour = 5280 feet per hour

To convert knots into miles per hour, multiply the number of knots by 1.151.

Saffir-Simpson Hurricane Wind Scale

Once a tropical storm reaches the level of a hurricane, it is then classified by the storm's intensity. Intensity levels, or categories, are used to assign a number (e.g., Category 1) to a hurricane based on the storm's intensity at the current time. The Saffir-Simpson Hurricane Wind Scale, **Table 3-11**, is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. With the scale in place, people within the hurricane's tract can better estimate the type of damage they should expect (i.e., wind, storm surge, and/or flooding impacts) due to the intensity of the oncoming hurricane.

Table 3-10: Saffir-Simpson Hurricane Wind Scale

Category	Sustained Winds	Types of Damage Due to Hurricane Winds
1	74-95 mph 64-82 kt 119-153 km/h	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96-110 mph 83-95 kt 154-177 km/h	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3 (major)	111-129 mph 96-112 kt 178-208 km/h	Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4 (major)	130-156 mph 113-136 kt 209-251 km/h	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5 (major)	157 mph or higher 137 kt or higher 252 km/h or higher	Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

(Source: National Hurricane Center – NOAA)

Threats Related to Hurricanes

Hurricanes impact regions in a variety of ways. The intensity of the storm, the speed of the winds, whether the storm moves through a region quickly or whether it stalls over one area all are variables toward the physical damage the storm will cause. Storm surges, high winds, and heavy rains are the three primary elements of hurricanes, while tornados and inland flooding are potential secondary elements caused in the wake of the storm. Greene County is not directly affected by storm surges; therefore, no additional analysis will be completed on the topic.

Greene County experienced 8 hurricane/tropical storm/tropical depression/high wind/strong wind events in a 10 year period resulting in an 80% (.80) probability that a hurricane/tropical storm/tropical depression/high wind/strong wind event will occur on an annual basis. The total amount of damages for the 8 hurricane/tropical storm/tropical depression/high wind/strong wind events was \$6,984,000 with 7 hurricane/tropical storm/tropical depression/high wind/strong wind events causing damage resulting in an estimated \$997,714 of expected annual damages from future events. The extent/range of magnitude or severity that could be experienced by Greene County due to hurricane/tropical storm/tropical depression/high wind/strong wind event is minor to major.

Primary Effects of Hurricanes:

1. Storm Surges
 - a. Primary cause of deaths in hurricanes
 - b. Large volumes of ocean water that are driven onshore by a land-falling hurricane or tropical storm
 - c. Can increase mean water level by 15 feet+ if accompanied by tide
2. Wind
 - a. Secondary cause of deaths related to hurricanes
 - b. Continue causing destruction as storm travels miles inland
 - c. Able to completely destroy towns and structures that fall within storm path
 - d. Winds near perimeter of eye of storm are strongest and most intense
 - e. Oftentimes produce tornados
3. Heavy Rains
 - a. Rain levels during hurricanes can easily exceed 15 to 20 inches
 - b. Cause flooding beyond coastal regions

Secondary Effects of Hurricanes:

1. Tornados
 - a. Usually found in right front quadrant of storm or embedded in rain bands
 - b. Some hurricanes capable of producing multiple twisters
 - c. Usually not accompanied by hail or numerous lightning strikes
 - d. Tornado production can occur for days after the hurricane makes landfall
 - e. Can develop at any time of the day or night during landfall of a hurricane

2. Inland Flooding

- a. Statistically responsible for greatest number of fatalities over last 30 years
- b. Stronger storms not necessarily cause of most flooding; weaker storms that move slowly across the landscape can deposit large amounts of rain causing significant flooding

Greene County is at a low risk for a direct hit by a hurricane due to its position several miles inland from the Alabama coastline. Although Greene County does not feel the effects of storm surges, other effects including heavy rain, flooding, and tornados often have significant impacts on Greene County.

IX. Sinkholes/ Expansive Soils

Sinkholes

Naturally occurring Sinkholes occur where limestone, carbonate rock, salt beds, or rocks can be dissolved by groundwater circulating through them. As the rock dissolves, spaces and caverns develop underground. The land usually stays intact until the underground spaces become too large to support the ground at the surface. When the ground loses its support it will collapse, forming a sinkhole. Sinkholes can be small or so extreme they consume an automobile or a house. The most damage from sinkholes tends to occur in Florida, Texas, Alabama, Missouri, Kentucky, Tennessee, and Pennsylvania.

According to the Geological Survey of Alabama's sinkhole data as of 2010, Greene County has experienced sinkholes; however, the sinkhole density in Greene County is low.

Figure 3-3 shows sinkholes and sinkhole density in Greene County.

Primary effects from sinkholes in Greene County would include:

1. Property damage
2. Underground infrastructure damage
3. Impassable roads
4. Building collapse

Hazardous results from significant sinkholes in Greene County would include:

1. Formation of sinkholes can destroy any structure it underlies. Houses, businesses, and government buildings are extremely susceptible to this damage.
2. Underground power, gas, and water lines can be broken causing leakage and breaks that can disrupt service and have negative environmental effects.
3. The ground underneath a road sinks and either leaves the road unsupported or destroys it completely. This is extremely dangerous for unsuspecting motorists and repair crews.
4. Unsupported foundations of buildings allow for collapse of the foundation and possibly the entire structure resulting in mass amounts of injury and damage as well as possible death.

There have been sinkholes reported in Greene County; however, there have been no reports of active sinkholes or land subsidence in Greene County during the study period of this

plan update.

Expansive Soils

Expansive soils are soils that swell when they come in contact with water. The presence of clay is generally the cause of such behavior. **Figure 3-4** shows the general soil areas for the state. Greene County has Coastal Plains and Prairie Soils. There were no expansive soils reported from NOAA or local sources during the time frame covered by the plan. Though these soils have shrink-swell potential, the committee does not feel a profile is necessary.

Figure 3-3: Sinkholes and Sinkhole Density

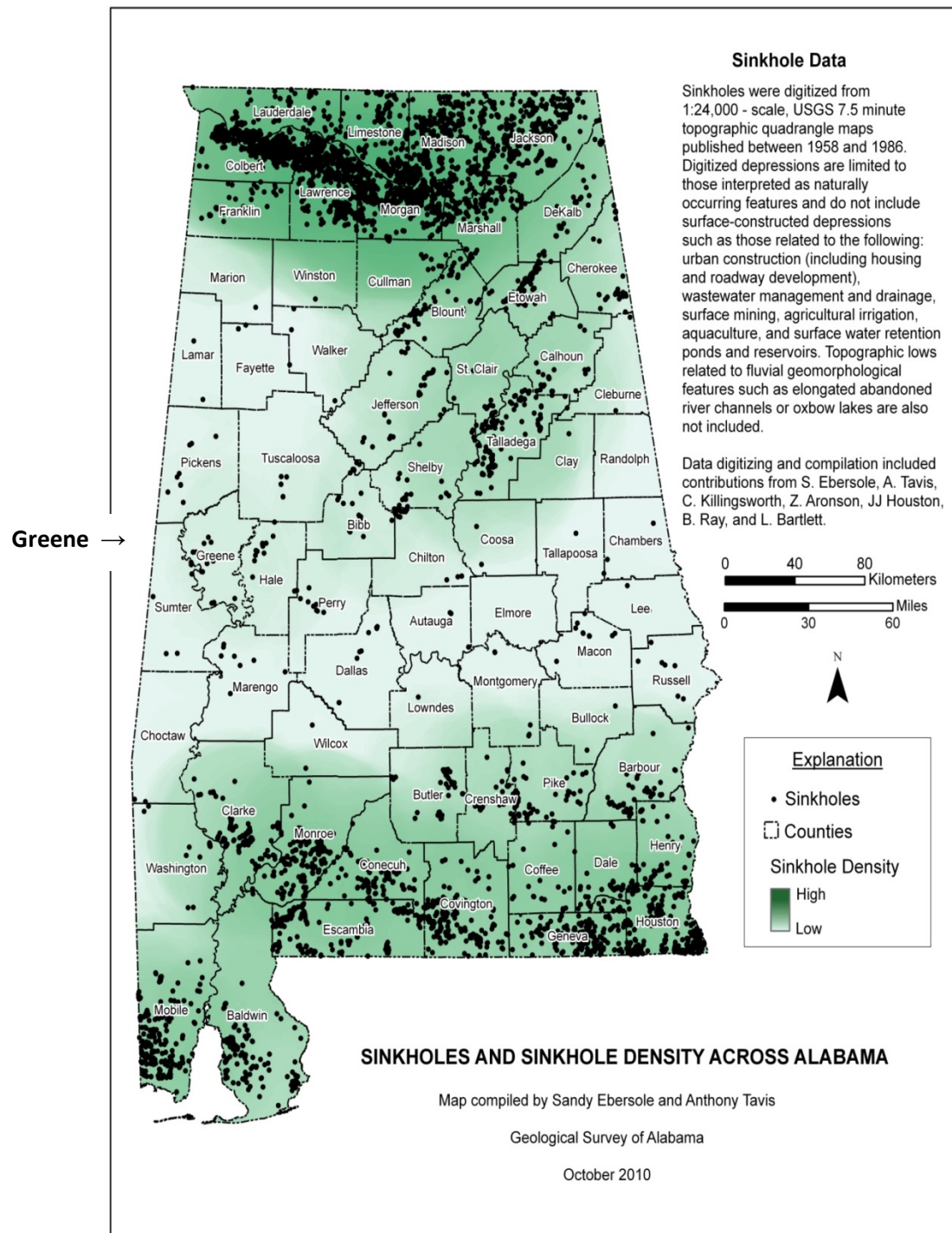
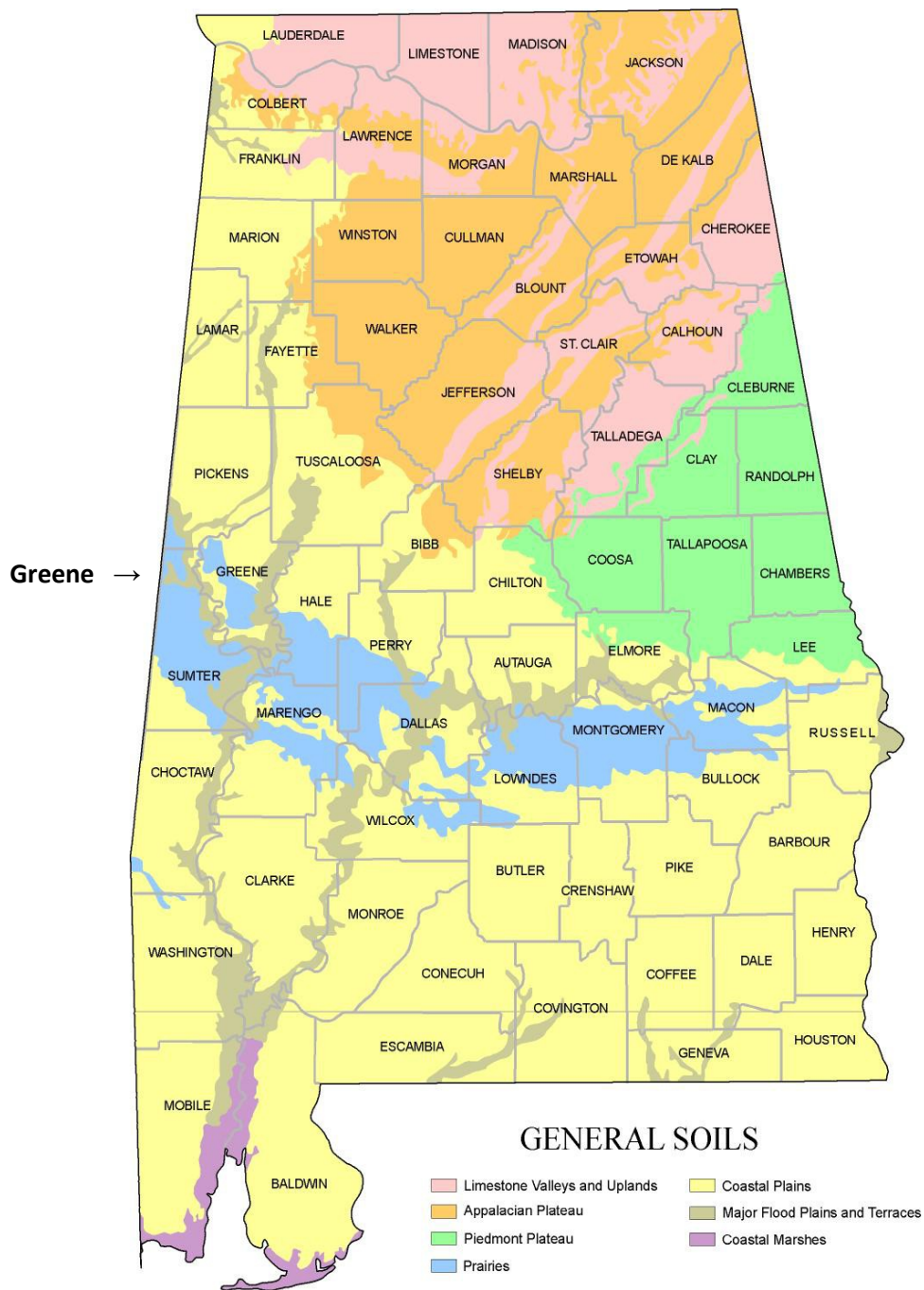


Figure 3-4: General Soils of Alabama



Source: Cartographic Research Lab, University of Alabama

X. Landslide

A landslide is defined by the United States Geological Survey as the movement of rock, debris, or earth down a slope. Various natural and man-induced triggers can cause a landslide. Naturally induced landslides occur as a result of weakened rock composition, heavy rain, changes in groundwater levels, and seismic activity. Geologic formations in a given area are key factors when determining landslide susceptibility. The three underlying geologic formations present within the region are the Coker, Gordo, and Tuscaloosa groups. These groups are classified as having low to moderate susceptibility to slope failure. A 1982 study performed by Karen F. Rheams of the United States Geological Survey indicated 23 landslides had occurred in the county but all of these were man-induced events attributed to roadway construction. **Figure 3-5** shows the landslide incidence and susceptibility and indicates that Greene County is at a low to no risk of incidence. There were no Greene County landslides reported from GSA or local sources during the time frame covered by this plan; therefore, plan information remains the same as in the 2009 update.

Primary effects from landslide in Greene County would include:

1. Property damage
2. Impassable roads
3. Sediment erosion
4. Underground infrastructure damage

Hazardous results from landslide in Greene County would include:

1. Landslides move with tremendous force capable of destroying most structures in its path while carrying anything it comes in contact with.
2. Material from landslides can damage and destroy roads as well as block them with debris resulting in disruption to business and other activity.
3. Removed sediment can leave the surrounding area bare and prone to erosion.
4. The flow of a landslide can rip underground pipes and wiring from an area as well as bury them deeper under debris creating a loss of services.

Figure 3-5: Landslide Incidence and Susceptibility in Greene County



Source: Geological Survey of Alabama

XI. Earthquake

An earthquake is a sudden slip on a fault and the resulting ground shaking and radiated seismic energy caused by an abrupt release of accumulated strain in the tectonic plates that comprise the earth's crust. These rigid plates, known as tectonic plates, are some 50 to 60 miles in thickness and move slowly and continuously over the earth's interior. The plates meet along their edges, where they move away, past or under each other at rates varying from less than a fraction of an inch up to five inches per year. While this sounds small, at a rate of two inches per year, a distance of 30 miles would be covered in approximately one million years (FEMA, 1997).

The tectonic plates continually bump, slide, catch, and hold as they move past each other which causes stress to accumulate along faults. When this stress exceeds the elastic limit of the rock, an earthquake occurs, immediately causing sudden ground motion and seismic activity. Secondary hazards may also occur, such as surface faulting, sinkholes, and landslides. While the majority of earthquakes occur near the edges of the tectonic plates, earthquakes may also occur at the interior of plates.

The vibration or shaking of the ground during an earthquake is described by ground motion. The severity of ground motion generally increases with the amount of energy released and decreases with distance from the fault or epicenter of the earthquake. Ground motion causes waves in the earth's interior, also known as seismic waves, and along the earth's surface, known as surface waves. The following are the two kinds of seismic waves:

☐ P (primary) waves are longitudinal or compression waves similar in character to sound waves that cause back-and-forth oscillation along the direction of travel (vertical motion), with particle motion in the same direction as wave travel. They move through the earth at approximately 15,000 MPH.

☐ S (secondary) waves, also known as shear waves, are slower than P waves and cause structures to vibrate from side-to-side (horizontal motion) due to particle motion at right angles to the direction of wave travel. Unreinforced buildings are more easily damaged by S waves. There are also two kinds of surface waves, Raleigh waves and Love waves. These waves travel more slowly and typically are significantly less damaging than seismic waves.

Seismic activity is commonly described in terms of magnitude and intensity. Magnitude (M) describes the total energy released and intensity (I) subjectively describes the effects at a particular location. Although an earthquake has only one magnitude, its intensity varies by location.

Magnitude is the measure of the amplitude of the seismic wave and is expressed by the Richter scale. The Richter scale is a logarithmic measurement, where an increase in the scale by one whole number represents a tenfold increase in measured amplitude of the earthquake.

Intensity is a measure of the strength of the shock at a particular location and is expressed by the Modified Mercalli Intensity (MMI) scale.

Another way of expressing an earthquake's severity is to compare its acceleration to the normal acceleration due to gravity. If an object is dropped while standing on the surface of the earth (ignoring wind resistance), it will fall towards earth and accelerate faster and faster until reaching terminal velocity. The acceleration due to gravity is often called "g" and is equal to 9.8 meters per second squared (980 cm/sec/sec). This means that every second something falls towards earth, its velocity increases by 9.8 meters per second. Peak ground acceleration (PGA) measures the rate of change of motion relative to the rate of acceleration due to gravity. For example, acceleration of the ground surface of 244 cm/sec/sec equals a PGA of 25.0 percent. It is possible to approximate the relationship between PGA, the Richter scale, and the MMI, as shown in **Table 3-12**. The relationships are, at best, approximate, and also depend upon such specifics as the distance from the epicenter and depth of the epicenter. An earthquake with 10.0 percent PGA would roughly correspond to an MMI intensity of V or VI, described as being felt by everyone, overturning unstable objects, or moving heavy furniture.

Table 3-11: Earthquake PGA, Magnitude and Intensity Comparison

PGA (%g)	Magnitude (Richter)	Intensity (MMI)	Description (MMI)
<0.17 – 1.4	1.0 – 3.0	I	Not felt except by a very few under especially favorable conditions.
0.17 – 1.4	3.0 – 3.9	II - III	II. Felt only by a few persons at rest, especially on upper floors of buildings. III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
1.4 – 9.2	4.0 – 4.9	IV - V	IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rock noticeably. V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
9.2 - 34	5.0 – 5.9	VI – VII	VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
34 – 124	6.0 – 6.9	VIII - IX	VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
>124	7.0 and higher	VIII or Higher	X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent. XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly. XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.
<i>(Source: http://earthquake.usgs.gov)</i>			

Earthquake-related ground failure, due to liquefaction, is a common potential hazard from strong earthquakes in the central and eastern United States. Liquefaction occurs when seismic waves pass through saturated granular soil, distorting its granular structure, and causing some of the empty spaces between granules to collapse. Pore-water pressure may also increase

sufficiently to cause the soil to behave like a fluid (rather than a soil) for a brief period and causing deformations. Liquefaction causes lateral spreads (horizontal movement commonly 10-15 feet, but up to 100 feet), flow failures (massive flows of soil, typically hundreds of feet, but up to 12 miles), and loss of bearing strength (soil deformations causing structures to settle or tip). Sands blows were common following major New Madrid earthquakes in the central United States.

The hazards associated with earthquakes include anything that can affect the lives of humans, including surface faulting, ground shaking, landslides, liquefaction, tectonic deformation, tsunamis, and seiches. Earthquake risk is defined as the probability of damage and loss that would result if an earthquake caused by a particular fault were to occur. Losses depend on several factors including the nature of building construction, population density, topography and soil conditions, and distance from the epicenter.

Interestingly, an earthquake's magnitude can be a poor indicator of hazard impact because the duration of ground shaking, and resulting increased damages, is not factored into the magnitude concept. The majority of losses are due to collapsing houses and other structures, the most vulnerable being those of unreinforced masonry and adobe. Structures built with more flexible materials such as steel framing are preferred. Wood frame construction, which constitutes a high percentage of homes in the United States, also tends to flex rather than collapse but is more susceptible to fire. Building codes have historically been utilized to address construction standards to mitigate damages for earthquakes and other hazards. However, older structures, non-compliance, and incomplete knowledge of needed measures remain a problem. In order to reduce losses to lives and property, wider adoption of improved construction methods for both residential and important critical facilities such as hospitals, schools, dams, power, water, and sewer utilities is needed.

Three zones of frequent earthquake activity affecting Alabama are the New Madrid Seismic Zone (NMSZ), the Southern Appalachian Seismic Zone (SASZ) (also called the Eastern Tennessee Seismic Zone), and the South Carolina Seismic Zone (SCSZ). The NMSZ lies within the central Mississippi Valley, extending from northeast Arkansas through southeast Missouri, western Tennessee, and western Kentucky, to southern Illinois. The SASZ extends from near Roanoke in southwestern Virginia southwestward to central Alabama. Considered a zone of moderate risk, the SASZ includes the Appalachian Mountains. Most of the earthquakes felt in

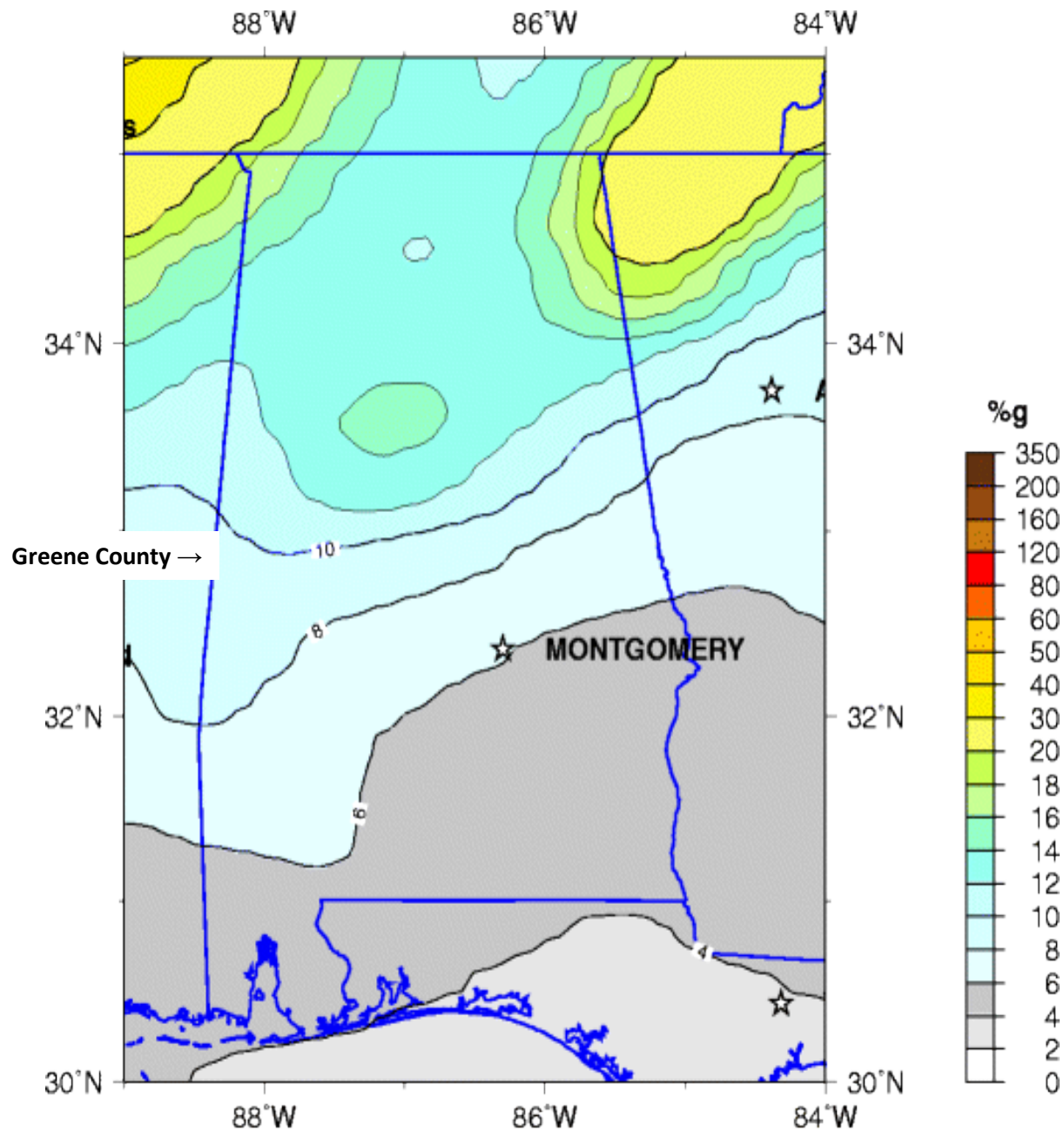
Alabama are centered in the SASZ. The hypocenters of earthquakes in this zone are on deeply buried faults. The SCSZ is centered near Charleston South Carolina and encompasses nearly the whole State. Greene County is at risk for earthquakes.

Earthquakes occurring in Greene County are predominantly low magnitude events. However, there is growing concern that a high magnitude event is inevitable and earthquakes are becoming a much larger concern to the county. GSA is currently working to better define seismic hazards and impacts throughout the county. **Figure 3-6** shows the Percent Ground Acceleration (PGA) with two percent 50 year exceedance probability. There is insufficient data to predict the future probability of an earthquake occurring in Greene County. The risk of a significant, damage-causing earthquake in Greene County is low to moderate.

Although many areas of the United States are better known for their susceptibility, earthquakes do occur in Alabama. **Figure 3-7** shows the seismic zones of the Southeastern United States, which includes Alabama, as well as the epicenters of earthquakes recorded in the state from 1886-2007 as provided by the Geological Survey of Alabama and noted in the Alabama EMA Earthquake Book 2002. Greene County experienced three earthquake events during the past ten years (January 1, 2003 – December 31, 2013) as noted in **Table 3-5**. Two earthquakes occurred in 2004, one in Union with a 2.6 magnitude and the other in the Forkland/Braggville area with a 4.3 magnitude. Another earthquake occurred in the Mt. Hebron/Boligee area in 2006 having a 2.5 magnitude. No deaths, injuries, or damages were reported from these earthquakes.

Two zones of frequent earthquake activity that could potentially impact Greene County are the New Madrid Seismic Zone and the Southern Appalachian Seismic Zone. Damage could be significant in Greene County if a powerful earthquake were to occur because buildings in this part of the country have not been constructed to withstand such a powerful force. In 1916 on October 18, a strong earthquake occurred on an unnamed fault east of Birmingham. It was apparently most strong at Easonville. Near the epicenter, chimneys were knocked down, windows broken, and frame buildings were greatly shaken. It was noted by residents in seven states and covered 100,000 square miles. The 1895 New Madrid earthquake registered a 6.8 on the Richter scale and was moderately felt throughout the southeastern United States. The New Madrid Fault line runs along the Mississippi River. Geologists agree that another major earthquake along the New Madrid Fault line could cause chimneys to fall, glass to break, and

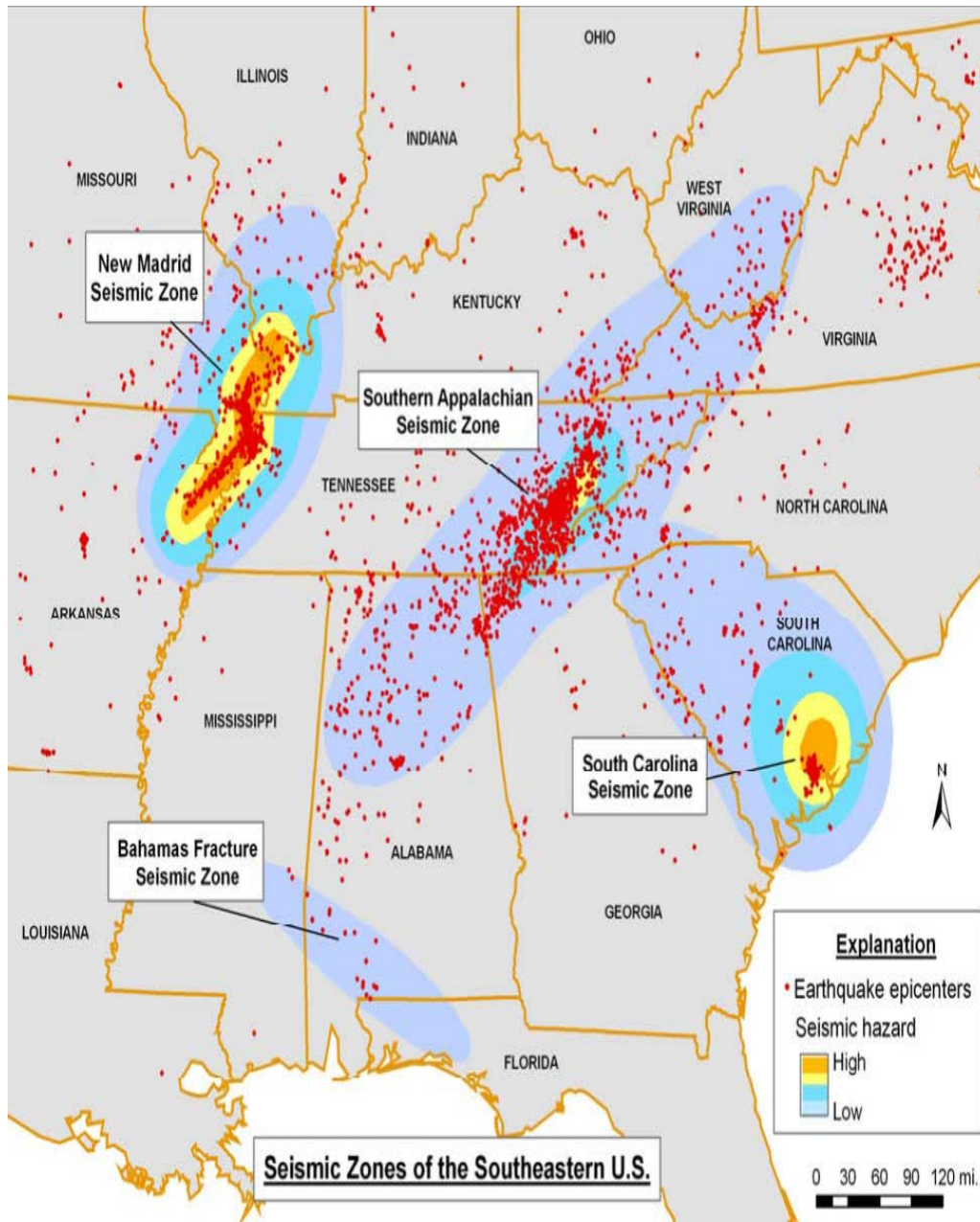
walls to crack in Greene County.



**Peak Acceleration (%g) with 2% Probability of Exceedance in 50 Years
site: NEHRP B-C boundary
National Seismic Hazard Mapping Project (2008)**

Figure 3-6

Figure 3-7: Seismic Zones of the Southeastern United States



Source: Geological Survey of Alabama, 2010

In the eastern United States strong earthquakes occur less frequently than other parts of the country; however, this does not mean that the damage in this area would be any less catastrophic should a powerful quake occur. There are two important reasons for this. The first is that the type of rock present in the eastern part of the country transmits seismic waves more effectively. This in turn creates better transmission of earthquake energy and results in higher damage over a wider area. Second, because buildings and other structures in the eastern United States have not been designed to withstand severe earth shaking, they will sustain more damage.

Greene County experienced 3 earthquake events in a 10 year period resulting in less than 100% (.30) probability that an earthquake event will occur on an annual basis. The total amount of damages for the 3 earthquake events was \$0 with no earthquake events causing damage resulting in an estimated \$0 of expected annual damages from future events. The extent/range of magnitude or severity that could be experienced by Greene County due to an earthquake event is minor to major as the county's infrastructure is not built to withstand such events.

Primary effects from earthquake in Greene County would include:

1. Property Damage
2. Underground infrastructure damage
3. Building collapse
4. Trigger for other natural disasters

Hazardous results from earthquake in Greene County would include:

1. Shaking can cause cracking of roads, bridges, or buildings, which may also lead to collapse.
2. Pipes and wiring underground could be severely damaged due to the movement of the Earth. This would result in interruption of service and long periods of repair before lines were serviceable again.
3. Buildings in Greene County are not built to meet the rigors of earthquakes; collapsing structures could kill or injure occupants.
4. Earthquakes can create other disasters such as landslides, flooding, and sinkholes. Shifting of underlying soil and breaching of dams are examples of possible results from an earthquake.

XII. Wildfire

Wildfires are responsible for burning thousands of acres of land across the United States each year. They are large, fast moving, disastrous fires that occur in the wilderness or rural areas. These fires are uncontrolled and in dry conditions can spread rapidly through the surrounding vegetation and structures. Greene County is susceptible to wild/forest fires especially during times of drought. Greene County has a total of 325,227 acres of forestland. The total acres are made up of 122,361 softwoods, 44,281 oak-pine, and 158,586 hardwoods. (*Source: Alabama Forestry Commission – Forest Resource Report 2012*)

The frequency and severity of wildfires is dependent on weather and on human activity. Nearly all wildfires in Greene County are human caused (only a small percent are caused by lightning), with arson and careless debris burning being the major causes of wildfires. If not promptly controlled, wildfires may grow into an emergency or disaster. Even small fires can threaten lives, damage forest resources and destroy structures. **Table 3-13** shows the number of fires and acres burned during the period 2010 to 2013, as recorded by the Alabama Forestry Commission. Greene County had a total of 54 fires during this 3 year period, affecting a total of 604.40 acres.

Greene County is located in an area where the current fire danger conditions are low to moderate, according to the U. S. Forestry Service. The National Forest Service (NFS) maintains data nationwide and produces various maps and forecasts daily under the Wildland Fire Assessment System (WFAS). A review of this data showed Greene County has a 5-10 percent probability of a fire occurring because of a lightning strike. The probability of ignition by lightning depends mainly on fuel moisture. Fuel Model Maps help to determine susceptibility of vegetative cover to wildfires. Greene County is covered by Fuel Models A and C. Areas covered by these models consist of light fuel vegetation such as herbaceous plants and round woods that are less than one-quarter of an inch.

Figure 3-8 and **Figure 3-9** from the Alabama Forestry Commission show Greene County's fire susceptibility and occurrence areas. The total acres burned by wildfires during 2010-2013 in Greene County were 604.40 acres. The number of fires per year in Greene County was 18 wildfires.

Table 3-12: Wildfires in Greene County 2010 - 2013					
County	Total # of Fires	Average # of Fires Per Year	Total Acres Burned	Average Acres Burned Per Year	Average Fire Size
Greene	54	18	604.40	202	11.2

Source: Alabama Forestry Commission

Greene County experienced 54 wildfire events in a 3 year period resulting in a greater than 100% (18.00) probability that a wildfire event will occur on an annual basis. The total amount of acres burned for the 54 wildfire events was 604.40 resulting in an estimated 11.2 acres burned per wildfire event.

Primary effects from wildfire in Greene County would include:

1. Loss of property
2. Loss of livestock
3. Destruction of wilderness
4. Crop destruction

Hazardous results from significant wildfire in Greene County would include:

1. Widespread fire destroys everything flammable, leaving people homeless and businesses destroyed.
2. Fenced in livestock have no way of escaping the path of a wildfire and most are lost due to smoke inhalation.
3. Most wildfires actually help forest grow because they rid the forest of underbrush, but exceptionally hot fires that have a long duration destroy entire forests.
4. An entire year's crop can be lost by burning through all vegetation.

Figure 3-8

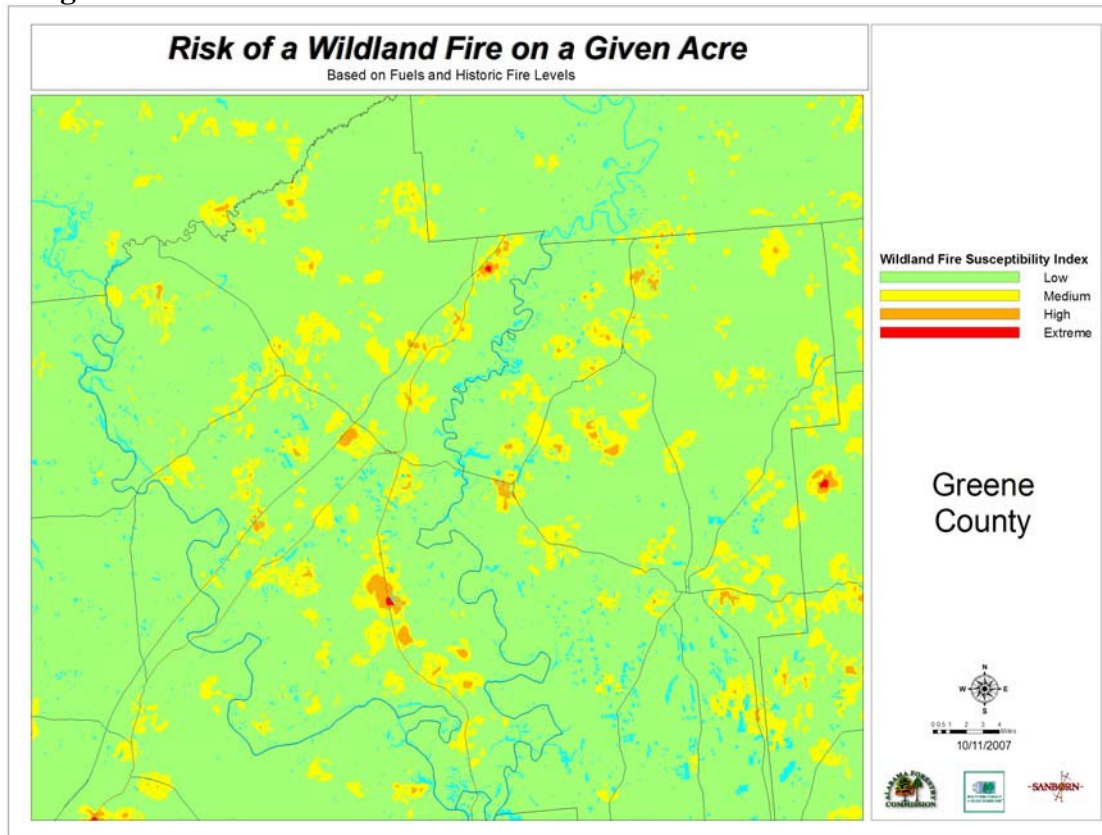
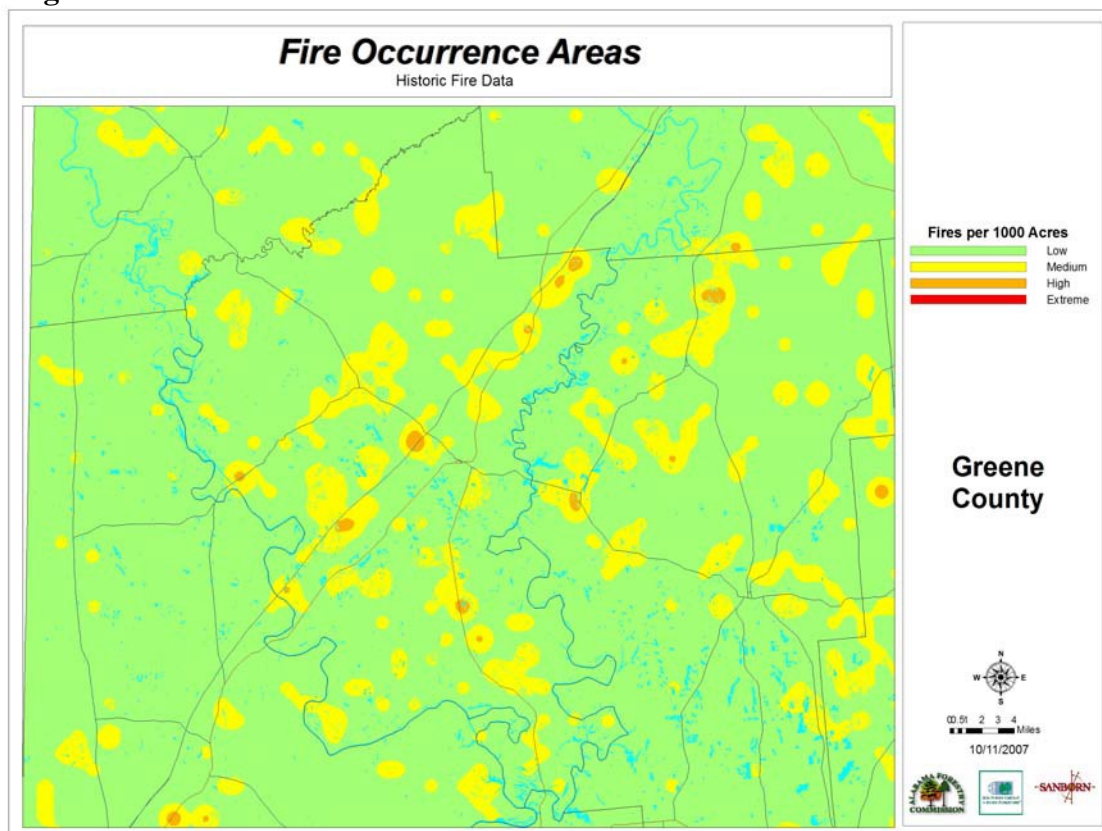


Figure 3-9



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XIII. Dam Failures

A dam is barriers constructed across a watercourse in order to store, control, or divert water. Dams are usually constructed of earth, rock, concrete, or mine tailings. The water impounded behind a dam is referred to as the reservoir and is measured in acre-feet, with one acre-foot being the volume of water that covers one acre of land to a depth of one foot. Due to topography, even a small dam may have a reservoir containing many acre-feet of water. A dam failure is the collapse, breach, or other failure of a dam that causes downstream flooding. Dam failures may result from natural events, human-caused events, or a combination thereof. Due to the lack of advance warning, failures resulting from natural events, such as hurricanes, earthquakes, or landslides, may be particularly severe. Prolonged rainfall that produces flooding is the most common cause of dam failure (FEMA, 1997).

Dam failures usually occur when the spillway capacity is inadequate and water overtops the dam or when internal erosion through the dam foundation occurs (also known as piping). If internal erosion or overtopping cause a full structural breach, a high-velocity, debris-laden wall of water is released and rushes downstream, damaging or destroying whatever is in its path.

Dam failures may result from one or more the following:

- ☐ Prolonged periods of rainfall and flooding (the cause of most failures)
- ☐ Inadequate spillway capacity which causes excess overtopping flows
- ☐ Internal erosion erosions due to embankment or foundation leakage or piping
- ☐ Improper maintenance
- ☐ Improper design
- ☐ Negligent operation
- ☐ Failure of upstream dams
- ☐ Landslides into reservoirs
- ☐ High winds
- ☐ Earthquakes

Dam failures are potentially the worst flood events. A dam failure is usually the result of neglect, poor design, or structural damage caused by a major event such as an earthquake. Historical records of dam/levee failures for Greene County are not available. When a dam fails, a large quantity of water is suddenly released downstream, destroying anything in its path. The area impacted by the water emitted by dam failure would encounter the same risks as those in a flood

zone during periods of flooding. The area directly affected by the water released during a dam failure is not county wide. The risks associated with dam/levee failures are the same as those risks associated with flooding. There have been no significant dam or levee failures reported in Greene County during 2003 - 2013.

Dam safety has been an ongoing hazard mitigation issue in the State of Alabama, especially for small dams that are privately owned and poorly maintained. No state law currently exists to regulate any private dams or the construction of new private dams, nor do private dams require federal licenses or inspections. There have been several attempts in the State of Alabama to pass legislation that would require inspection of dams on bodies of water over 50 acre-feet or dams higher than 25 feet. Enactment has been hampered by the opposition of agricultural interest groups and insurance companies. Once established, the program will provide an up-to-date inventory of dams in Greene County. A full inventory of dams will help to benefit public safety and emergency response operations in the event of a natural or other disaster. It will also provide for the inspection and permitting certification of certain dams in order to protect the citizens of Alabama by reducing the risk of failure of such dams. According to *HAZUS-MH 2.1* and *NOAA*, Greene County has 69 High Density Polyethylene (HPDE - Earth) Dams including one high hazard dam (failure or poor operation would likely result in the loss of human life), three significant hazard dams (failure or poor operation would not likely result in the loss of human life, but would result in economic loss, environmental damage, and disruption of lifeline facilities), and 65 low hazard dams (failure or poor operations would not likely result in the loss of human life, but would result in low economic and environmental damage). **Table 3-14** shows risk categories of dams. **Table 3-15** provides an inventory listing of all the dams in Greene County and includes additional data on each.

The probability of future occurrences cannot be characterized on a countywide basis because of the lack of information available. The qualitative probability is rated low because the overall area affected is low and impacts are localized. This rating is intended only for general comparison to other hazards that are being considered.

Primary effects from Dam failure in Greene County would include:

1. Loss of life
2. Destruction of property
3. Unregulated water flow to surrounding areas
4. Increased amount of disease and disease-carrying animals in the area

Hazardous results from dam failure in Greene County would include:

1. Heavy flooding would be a direct result of a dam failure causing many deaths by injuring and trapping people in structures.
2. Large amounts of water would sweep with it property and severely damage any that remained in the area. Chemical spills from local factories caused by rushing water would pollute the area and destroy crops and other property.
3. The river would be able to flow naturally once the dam was breached, damaging any structures in the path, as well as interrupted wildlife cycles and hydrologic power supply.
4. A direct result of the flood would be increased disease such as West Nile and Malaria as a result of the unsanitary conditions.

Table 3-13: Greene County Dams Risk Categories	
Risk Categories	Number of Dams
High - loss of one human life is likely if the dam fails	1
Significant - possible loss of human life and likely significant property or environmental destruction if the dam fails if the dam fails	3
Low	65
Total	69
<i>(Source: HAZUS MH 2.1)</i>	

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Table 3-14: Greene County Dam Inventory

	DAM NAME	National ID	Latitude	Longitude	Volume	Spill Width	Maximum Discharge
1	W.R.ODUM LAKES AND DAMS	AL00734	32.83	-87.92	0.00	0.00	850.00
2	W.D.JOHNSTON DAM	AL00745	32.64	-88.01	0.00	0.00	200.00
3	HOMER CARPENTER DAM	AL00744	33.00	-88.05	0.00	0.00	4,350.00
4	HOWARD BROWN DAM	AL00739	32.78	-87.86	0.00	0.00	680.00
5	W.D.JOHNSTON DAMS	AL00746	32.63	-88.01	0.00	0.00	200.00
6	DOLLARHIDE HUNTING CLUB DAMS	AL00732	32.74	-87.81	0.00	0.00	210.00
7	DOLLARHIDE HUNTING CLUB DAMS	AL00731	32.75	-87.83	0.00	0.00	100.00
8	DOLLARHIDE HUNTING CLUB DAMS	AL00730	32.74	-87.85	0.00	0.00	90.00
9	DON DRENNEN DAM NUMBER 2	AL00728	32.73	-88.02	0.00	0.00	225.00
10	DON DRENNEN DAM NUMBER 1	AL00727	32.73	-88.02	0.00	0.00	700.00
11	NAB DRENNEN DAMS	AL00729	32.64	-88.07	0.00	0.00	680.00
12	W.P.MCLEAN DAM NUMBER 1	AL00741	32.88	-87.96	0.00	0.00	510.00
13	C N DRENNEN DAM NUMBER 2	AL01536	32.72	-88.03	0.00	0.00	270.00
14	C N DRENNEN DAM NUMBER 3	AL01537	32.73	-88.03	0.00	0.00	210.00
15	C N DRENNEN DAM NUMBER 4	AL01538	32.73	-88.03	0.00	0.00	225.00
16	NAB DRENNEN DAM NUMBER 2	AL01539	32.64	-88.07	0.00	0.00	54.00
17	REED DAM	AL01540	32.65	-87.99	0.00	0.00	150.00
18	G W BAKER DAM	AL01541	32.70	-87.97	0.00	0.00	680.00
19	C N DRENNEN DAM NUMBER 1	AL01535	32.73	-88.03	0.00	0.00	340.00
20	SHECHI LAKE DAM NUMBER TWO	AL01669	33.01	-87.83	0.00	0.00	525.00
21	HOWELL HEFLIN LOCK AND DAM	AL01980	32.83	-88.17	1,576,000.00	523.00	225,000.00
22	BANKS LAKE	AL00736	32.84	-87.93	12,284.00	30.00	160.00
23	HARDY LAKE #1	AL00738	32.77	-87.9	19,240.00	24.00	1,032.00
24	W A TAYLOR CAMP DAM	AL00751	32.76	-87.88	8,000.00	60.00	80.00
25	DOCTOR HOLLINGSWORTH DAM	AL00750	32.77	-87.9	87,506.00	60.00	400.00
26	SPREE'S #1 LAKE	AL00749	32.75	-88.05	12,000.00	50.00	205.00
27	BRYANT POND	AL02076	32.92	-88.03	36,881.00	56.00	300.00
28	BISHOP POND	AL02075	32.80	-87.9	26,282.00	100.00	200.00
28	STILL POND	AL02077	32.73	-87.9	24,763.00	100.00	660.00
30	PAUL NO. 2	AL02309	32.74	-87.9	19,805.00	60.00	125.00
31	PAUL NO. 3	AL02308	32.74	-87.89	21,806.00	60.00	800.00
32	BAUMHOWER NO. 1	AL02319	32.72	-87.9	17,288.00	100.00	670.00
33	BISHOP NO.7	AL02403	32.81	-87.9	22,413.00	120.00	860.00
34	BISHOP NO.8	AL02404	32.82	-87.91	28,470.00	75.00	550.00
35	BISHOP NO.9	AL02405	32.81	-87.9	25,976.00	133.00	950.00
36	HALES POND NO.1	AL02406	32.87	-88.07	24,010.00	40.00	450.00
37	J.H. MONTGOMERY III NO.1	AL02407	32.93	-88.07	13,584.00	40.00	310.00
38	ODOM NO.1	AL02408	32.82	-87.91	19,426.00	58.00	440.00
39	ODOM NO.2	AL02409	32.83	-87.91	16,259.00	58.00	440.00

	DAM NAME	National ID	Latitude	Longitude	Volume	Spill Width	Maximum Discharge
40	ODOM NO.3	AL02410	32.83	-87.91	16,738.00	58.00	440.00
41	SPREE NO.2	AL02411	32.77	-87.95	17,917.00	37.00	285.00
42	SPREE NO.3	AL02412	32.78	-87.96	22,902.00	47.00	350.00
43	SPREE NO.4	AL02413	32.78	-87.96	7,599.00	40.00	29.00
44	SPREE NO.5	AL02414	32.79	-87.95	16,611.00	51.00	380.00
45	SPREE NO.6	AL02415	32.79	-87.96	19,204.00	57.00	430.00
46	STEVENS NO.4	AL02416	32.78	-87.87	12,111.00	43.00	310.00
47	KILGORE NO.1	AL02417	32.84	-88	23,231.00	70.00	1,050.00
48	KILGORE NO.2	AL02418	32.85	-88	16,474.00	40.00	310.00
49	FINCHER DAM	AL02419	32.77	-87.94	38,086.00	10.00	25.00
50	SOLOMON DAM	AL02420	32.93	-88.02	15,811.00	72.00	530.00
51	MARC MCCLELLAN NO. 1	AL02359	32.87	-88.06	11,114.00	10.00	87.00
52	MARC MCCLELLAN NO. 2	AL02290	32.87	-88.06	9,820.00	35.00	275.00
53	MARC MCCLELLAN NO. 3	AL02291	32.86	-88.06	12,667.00	73.00	800.00
54	TROUPE TRICE NO.1	AL02292	32.76	-88.02	11,451.00	10.00	87.00
55	PAUL BRYANT JR. 3K	AL02293	32.80	-88.07	16,207.00	76.00	700.00
56	PAUL BRYANT JR. H1	AL02294	32.85	-88.02	18,223.00	55.00	790.00
57	PAUL BRYANT JR. H3	AL02295	32.85	-88.01	15,212.00	24.00	310.00
58	C.T. SOLOMON STOCKYARD NO.1	AL02296	32.82	-87.93	15,889.00	40.00	340.00
59	KILGORE #4	AL02421	32.84	-88	19,610.00	80.00	1,100.00
60	KILGORE #5	AL02422	32.84	-87.99	40,475.00	80.00	1,100.00
61	KILGORE #6	AL02423	32.84	-88	22,052.00	45.00	420.00
62	KILGORE #7	AL02424	32.84	-88	14,485.00	45.00	420.00
63	KILGORE #8	AL02425	32.84	-88.01	13,276.00	34.00	300.00
64	PAUL BRYANT JR. POND B5	AL02282	32.85	-87.98	15,427.00	45.00	350.00
65	C.T. SOLOMON POND 3S	AL02437	32.82	-87.95	12,862.00	10.00	80.00
66	C.T. SOLOMON POND 4S	AL02438	32.82	-87.95	20,501.00	10.00	80.00
67	C.T. SOLOMON POND 7S	AL02439	32.82	-87.95	25,891.00	10.00	80.00
68	WILLIAMS DAM	AL02455	32.89	-88.1	4,754.00	62.00	580.00
69	BRITTAIN DAM	AL02456	32.91	-88.09	19,620.00	16.00	130.00

(Source: HAZUS MH 2.1)

Section Four: Vulnerability Assessment

In Section Three, the primary effects and hazardous results were considered for all identified hazards. In this section each hazard was further reviewed to identify the impacts on the county and its jurisdictions. Impact in terms of dollar value for past hazard occurrences are shown for the county in **Table 3-5** and for each jurisdiction in their individual Hazard Event table in Section Five of this plan.

Vulnerability is the extent to which something is damaged by a hazard. Vulnerability is very often measured using “damage functions.” These are based on studies of how buildings perform when they are exposed to hazards. Similar functions are available for infrastructure and other physical assets. Injury and mortality functions (how many people are injured or die during events) are also sometimes used as indicators of vulnerability, but these are generally not as reliable as functions for physical assets because there are many more variables.

Thunderstorms

Damage from thunderstorms can have a wide range of severity. All jurisdictions are vulnerable to thunderstorm events. One thunderstorm event occurring in Greene County during 2003-2013 in Boligee had a wind magnitude of 86 miles per hour (75 kts.) and resulted in \$200,000 property damages and \$1.6 million crop damages. On April 10, 2004, a supercell thunderstorm moved across Greene, Hale, and Perry Counties and produced significant wind damage along with very large hail. The supercell produced minor tree damage in extreme northwest Greene County north of Boligee and then became stronger. The most extensive damage started just northeast of Eutaw, in Greene County, along US 11 and ended just north of the Wedgewood community. The swath of damage was 1.5 miles wide at the beginning point and 3 miles wide at the ending point. The path length was approximately 6.5 miles long. Inside this extensive damage area, thousands of trees were snapped off or uprooted, numerous power lines were snapped off or blown down, and many structures were damaged by falling trees. Very large hail also fell during the storm. The largest hail observed was 2.50 inches in diameter and drifted to over one foot deep in many places. The hail damaged a few homes and several automobiles. Some locations reporting hail and wind damage include Eutaw, Boligee, Sawyerville, Akron, Greensboro, and Marion. (*Source: NOAA NCDC*)

Lightning

Lightning can cause substantial property damage and loss of human lives. All jurisdictions are vulnerable to lightning events.

Hail

Severe thunderstorms, as the one referenced under thunderstorms above, have been known to produce hailstones 2.50 inch in diameter (tennis ball size) in Greene County. Another hail storm occurred on May 2, 2003 in Eutaw that produced penny to golf ball sized hail and resulted in \$70,000 of property damages. This particular storm was the second hail storm within 30 minutes to affect Greene County on that day. All jurisdictions are vulnerable to hail events.

(Source: NOAA NCDC)

Tornados

The impacts of tornados can be far-reaching. Life, property, and personal items are at risk. Tornados do not follow a definite path; all jurisdictions are vulnerable to tornado events. Property damage, injury, and death can result from the weakest tornados. Interruption of electrical services, communications, and other utilities may occur. Transportation corridors may be blocked or even destroyed. Debris removal can take time and can be costly. Residents may suffer from post-traumatic stress disorder, depression, anxiety, and grief for lost loved ones. Longer response times results from having limited emergency personnel.

Areas with higher population densities pose the greatest potential for property damage, injury, and death. The City of Eutaw is the most densely populated area in the county. Communities with a high concentration of mobile homes are extremely vulnerable to tornados. Mobile homes are not capable of withstanding the strong winds associated with tornados. The Town of Forkland is extremely vulnerable as the town has a high concentration of mobile homes. Greene County has a total of 1,602 mobile homes countywide, 32% of the total housing stock. The greatest concentration of mobile homes in a municipality is in the Town of Forkland where 48% of the units are mobile homes.

One tornado event occurred in the Forkland area of Greene County on April 24, 2010 that resulted in two injuries and \$50,000 of property damages. A deepening storm system and

associated cold front brought widespread severe thunderstorms, including at least 8 tornadoes, to Central Alabama. The tornado that had touched down in Marengo County, near the City of Demopolis, moved into Greene County. On its northeast path, it produced sporadic tree damage, and stayed mostly in forested areas. Just before crossing the Black Warrior River for the second time, it struck the Greene County Steam Plant, where two men were injured when they were blown down by the wind. A few small buildings were damaged in the same area, and a tractor trailer rig was blown over and moved at least 40 feet. The tornado then moved into Hale County.

Another powerful storm system crossed the Southeast United States on Wednesday, April 27, 2011, resulting in a large and deadly tornado outbreak. This epic event broke the record for number of tornadoes in a day for the state of Alabama, becoming the most significant tornado outbreak in the state's history. No fatalities or injuries resulted in Greene County from this event; however, Tishabee suffered \$5 million in property damages. A tornado touched down in Southwestern Greene County and moved northeast through central Hale and Bibb counties, before lifting near Marvel in far northeast Bibb County. The tornado touched down near the Tombigbee River, west of Tishabee on CR 69, and intensified to an EF2 rating with winds of 120 mph. As the tornado moved northeast, hundreds of trees were downed, a barn damaged, two small churches destroyed, and several mobile homes destroyed. The tornado crossed US Hwy 43 near Thornhill, destroying a large metal outbuilding and causing major roof and wall damage to several brick buildings. At least two minor injuries were noted along the path in Greene County. The tornado crossed the Black Warrior River and into Hale County east of Lake Mark Hanna.

Central Alabama had two rounds of severe weather that day. During the early morning hours, a Quasi-Linear Convective System quickly moved across the northern half of the National Weather Service, Birmingham county warning area. Straight line winds of 90 mph (78kts) or greater and 11 tornadoes lead to widespread damage and power outages. During the afternoon, long-lived supercell thunderstorms produced long-track, strong and violent tornadoes. Destruction and loss of life across many towns and communities was devastating.

Most of the violent tornadoes from this day were captured on video by a number of people, including storm spotters and chasers, as well as numerous television news crews and remotely controlled web-enabled video cameras. This allowed unprecedented coverage and viewing of this historic event in real time from people worldwide. (*Source: NOAA NCDC*)

Flood/Flash Flood

Flooding can occur along the banks of the creeks and streams that flow throughout the county and where development has encroached in the floodplain. Flash flooding can occur anywhere in the county due to inadequate or clogged drainage systems and excessive rainfall. Unpaved dirt roads, common in the rural areas, are particularly vulnerable. Impacts in developed areas include street flooding and water backing up into homes and buildings. In addition to damaging homes, flooding can adversely impact crops, water and sewer systems, and dams and levees. Greene County is flanked by two major rivers--the Alabama-Tombigbee to the west and south, and the Black Warrior to the east. Many seasonal homes are along these rivers. Flooding has impacted these homes to a greater degree than the rest of the county and accounted for the 15 identified Repetitive Loss properties in Greene County that were listed in the 2009 plan revision. All jurisdictions are vulnerable to flood events. (*Source: NOAA NCDC*)

On June 12, 2005, Tropical Storm Arlene dumped heavy rain across Central Alabama. The runoff affected river stages through June 17th. The heaviest rainfall of 2 to 5 inches, with isolated amounts up to 8 inches, occurred over the Western half of Central Alabama. The heavy rain amounts primarily affected the Tombigbee, Lower Black Warrior and Sucarnoochee River Basins where mainly minor flooding occurred. The higher stages primarily resulted in the overflow of farm and pastureland. Additional minor overflow occurred along the Lower Cahaba, Lower Alabama and Lower Tallapoosa Rivers where only caution stages were reached. In Greene County, several roads were temporarily flooded due to river overflow. One road was totally washed away. The county experienced \$20,000 in property damages. (*Source: NOAA NCDC*)

On September 21, 2009 a warm and unstable air mass led to the development of slow moving thunderstorms, many of which produced flash flooding and few that produced large hail. Several locations in Northern Greene County became flooded, including County Road 60 near the Mantua Community. Several homes in the Jena Community were also flooded.

Drought/Extreme Heat

All jurisdictions are vulnerable to occurrences of drought and extreme heat. Droughts may cause a shortage of water for human and industrial consumption, hydroelectric power, recreation, and navigation. Water quality may also decline and the number and severity of wildfires may increase. Severe droughts may result in the loss of agricultural crops and forest products, undernourished wildlife and livestock, lower land values, and higher unemployment. No deaths, injuries, property or crop damages resulted from drought events in Greene County; although, the effects of such events greatly affected the area.

In 2006, Greene County experienced severe (D2) to extreme (D3) drought conditions. An extended period of low rainfall caused severe drought (D2) conditions to spread northward into most of Central Alabama, including all but the northeastern counties. Hydrologic and agricultural impacts lasted through the remainder of July. Severe (D2) to extreme (D3) drought conditions, that developed in July, continued and spread across all of Central Alabama through the month of August. The area with the greatest impact, with extreme (D3) conditions through the first half of the month, was generally along and south of U.S. Route 80. Summer crops were adversely impacted, and many cities put water restriction rules into effect due to the hydrologic impact. Several bouts of significant precipitation in the middle of September which helped conditions improve to better than D2 drought by the morning of the September 19. (*Source: NOAA NCDC*)

From March 2007 to February of 2008, Greene County experienced D2 (severe) to D4 (exceptional) drought conditions. An extreme lack of rainfall resulted in hydrologic and agricultural impacts. Most stream flows reached or nearly reached record low levels, and reservoir operators struggled to fill pools to normal summer levels. Rainfall for the month of May was below a half inch in most areas, with some locations receiving less than one tenth of an inch of rain. By the end of May, year-to-date rainfall deficits ranged from 10 to 20 inches, with the highest deficits in the northern and northwest sections of Central Alabama. Area water utility companies enacted conservation plans. Agriculture also remained highly impacted. Below normal rainfall (generally one to three inches) across Central Alabama through the month of June exacerbated the ongoing drought conditions. By the end of the June, all or portions of 24 Central Alabama counties were placed in the Exceptional (D4) Drought category. Crops became highly stressed due to the lack of rainfall, with losses by the end of June ranging

from 50 to nearly 100 percent in some Central Alabama counties. Stream flows on area rivers and waterways remained near record low levels, and most reservoir levels were well below normal. The number of mandatory water restrictions continued to increase, with fines and surcharges being enforced for excessive water usage. Many residential lawns, shrubbery, and gardens became severely stressed by the very dry conditions. Severe (D2) to Exceptional (D4) drought conditions continued across Central Alabama through the month of July, despite a small increase in the frequency and amount of rainfall. Agricultural, hydrologic, and sociological impacts continued to be widely felt. By the end of July, more than 3/4 of the corn crop was still considered to be in poor or very poor condition, as well as about half of the cotton and soybean crop, along with livestock and hay production. Major rivers and reservoirs continued to run much below normal, with serious negative impacts. Area water utility companies continued to enforce fines and surcharges for excessive water usage, and water restriction plans remained in effect. Continued dry and very hot conditions across Central Alabama in the month of August led to worsening drought conditions. By the end of the month, more than 90 percent of Central Alabama had been placed in the Exceptional Drought (D4) designation, with the remainder in Severe Drought (D3). Around 80 percent of the corn and soybean crop, 70 percent of the cotton crop, and 40 percent of the peanut crop, was considered to be in poor or very poor condition by month's end. In addition, about 60 percent of the livestock, and 75 percent of pasture lands were also considered to be poor or very poor, and hay yields for the summer were less than half of normal. Major rivers and reservoirs continued to run much below normal. Navigation on major rivers became significantly impacted, and many boat landings on major lakes became unusable due to extremely low lake levels. Area water utility companies continued to enforce fines and surcharges for excessive water usage, and water restriction plans remained in effect. Drought conditions continued across Central Alabama through the month of September, despite slightly increased thunderstorm activity and rainfall from the remnants of Tropical Storm Humberto. By the end of September, roughly 3/4 of Central Alabama remained in the Exceptional Drought (D4) designation, with the remainder in Severe (D2) to Extreme (D3) Drought. According to the USDA, this was one of the worst seasons ever for cotton. Major rivers and reservoirs continued to run much below normal. Drought conditions continued across most of Central Alabama through the month of October, despite the rainfall received from a pair of storm systems that brought some showers and thunderstorms to the state during the latter half of the month. By the end of October, roughly

half of Central Alabama remained in the Exceptional Drought (D4) designation, with the remainder in Moderate (D1) to Extreme (D3) Drought. Agricultural, hydrologic, and sociological impacts continued to be widely felt. The rainfall that did occur in October came too late to help many crops. On Lake Martin, all marinas had to be shut down because there was no access to them due to the low lake levels. Drought conditions continued across most of Central Alabama through the month of November, despite the rainfall received from several storm systems that brought some showers and thunderstorms to the state. By the end of November, roughly $\frac{3}{4}$ of Central Alabama was considered to be in Exceptional Drought (D4), with the remainder in Moderate (D1) to Extreme (D3) Drought. The rainfall that did occur in November came too late to help many crops. The dry weather also hampered the planting of winter crops, due to very dry and hard soils. Although rainfall during November produced some very minor rises on area rivers and reservoirs, most continued to be much below normal with serious negative impacts continuing. Pool levels on some reservoirs were at or near record low levels. Some of the most serious impacts continued on the Coosa and Tallapoosa Rivers. Drought conditions continued across most of Central Alabama through the month of December, with monthly rainfall deficits around 2 to 3 inches. Agricultural impacts were lessened due to the end of the autumn harvesting season. However, hydrologic and sociological impacts continued to be widely felt. Most stream and river levels across Central Alabama continued to be much below normal with serious negative impacts continuing. Some of the most serious impacts continued on the Coosa and Tallapoosa Rivers. The threat of water shortages for municipal water systems persisted, and most water restriction plans already in place continued. (*Source: NOAA NCDC*)

Drought conditions continued across most of Central Alabama through the month of January, with monthly rainfall deficits ranging from .5 to 2.5 inches. Agricultural impacts were relatively low due to being in between growing seasons. However, hydrologic and sociologic impacts continued to be felt. Most stream and river levels across Central Alabama continued to be much below normal, with flow levels generally 25 percent or less of normal. Reservoir levels showed limited improvement due to rainfall that occurred during the month. The threat of water shortages for municipal water systems persisted, and most water restriction plans already in place continued. By the end of February, western and southern portions of Central Alabama, including Sumter, Greene, Pike, and Barbour Counties, were removed from the Severe (D2) Drought designation that had been in place since Spring 2007. (*Source: NOAA NCDC*)

Extreme summer heat is the combination of very high temperatures and exceptionally humid conditions. If such conditions persist for an extended period of time, it is called a heat wave (FEMA). Heat stress can be indexed by combining the effects of temperature and humidity. The index estimates the relationship between dry bulb temperatures (at different humidity) and the skin's resistance to heat and moisture transfer - the higher the temperature or humidity, the higher the apparent temperature. The human risks associated with extreme heat include heatstroke, heat exhaustion, heat syncope, heat cramps. Greene County experienced no extreme heat events during 2003-2013. (*Source: NOAA NCDC*)

Winter Storm/Frost Freeze/Heavy Snow/Ice Storm/Winter Weather/Extreme Cold

Greene County commonly has extreme cold and winter storm events in any given year. These events impact the county in a variety of ways. Ice and small amounts of snow can cripple the county. Drivers are not accustomed to driving in these conditions, therefore many accidents occur. Snow and ice can weigh down tree limbs and power lines causing them to break, resulting in power failure and property damage. Local businesses and residents are not equipped with generators to restore power during these severe winter weather events. Also many homes may not be properly insulated, leading to health concerns and deaths. Since these storms have no defined track, all residents of Greene County are vulnerable to severe winter storms. No deaths, injuries, property or crop damages occurred as results of such storms in Greene County from 2003-2013; however, the effects of such events were felt.

Extreme cold weather in 2003 resulted in the coldest temperatures in 7 years occurred across much of North and Central Alabama and lasted for about two days. Early morning temperatures ranged from 2 to 10 degrees. The coldest temperatures were measured in outlying areas. Although no new records were established, these temperatures were very cold for the Deep South. Many area residents reported frozen and broken water pipes as a result of the extended cold. Several lawn sprinkler systems also froze and broke making many areas very icy. Many area farmers lost a large part of their strawberry crops.

Winter weather events occurred in Greene County during 2008, 2010, and 2011. In 2011, light snowfall across the county resulted in reduced visibilities and hazardous travel conditions. In 2010, a period of snow accumulated to between 1 and 2 inches across Greene County, causing hazardous travel conditions. In 2008, accumulation up to one inch was reported in the southern part of the county, with less than an inch reported elsewhere.

Icy conditions occurred in January 2011. A low pressure system moved across the northern Gulf of Mexico; moisture pushed northward into Central Alabama, interacting with cold air already in place across the area. The combination of moisture and cold air brought a wintry mix of precipitation to most of Central Alabama, Sunday afternoon through Monday morning. One quarter inch of ice reported coating most surfaces across the county with isolated locations up to one half inch ice accumulation, including near Eutaw.

Hurricanes/Tropical Storms/Tropical Depressions/Strong Winds/High Winds

Greene County has experienced several hurricane/tropical storm/tropical depression/strong wind/high wind events. Fallen trees, high winds, and excessive rain were widespread throughout the county. These storms left large numbers of residents without power and tremendous amounts of debris blocking roadways. Like tornados, the impact from these events is most felt by those living in mobile homes in the county and its jurisdictions (31.8% of the housing stock). Additional impacts include clean-up of debris and the restoration of power and other damaged utilities. The effects of these events are often widespread and not concentrated to an isolated or specific location. Inadequate manpower to deal with the amount of damage often causes delays getting systems back to normal, further impacting residents.

Hurricane, tropical storm, tropical depression, strong wind, and high wind events have affected Greene County. The most significant impacts have been related to excessive rainfall, damaging wind, and tornados. Residents suffer loss of power, damage to homes, blocked roadways from associated storm debris, and loss of other crucial utilities. Mobile homes are particularly vulnerable and are impacted more than conventionally built structures. Mobile homes in the county represent 42% of the housing stock. Effects of these storms generally impact the entire county and are not limited to a specific location. The fact that other surrounding counties will have also been affected by the same event only adds to the burden, as utility crews are often overwhelmed by the needs of an entire region or state.

Hurricane Katrina made landfall on August 29, 2005 near Buras, Louisiana as a Category 3 storm and became known not only as the costliest but also as one of the most devastating hurricanes in the history of the United States. It is the deadliest hurricane to strike U.S. coastlines since 1928 and produced damages in excess of \$75 billion. Katrina had maximum sustained winds estimated to be 120 MPH at landfall. As Katrina moved across land, the storm weakened, though it maintained hurricane status past Laurel, Mississippi.

Southwestern Alabama experienced hurricane conditions as Katrina moved through neighboring Mississippi. The effects of Katrina were widespread across Alabama, particularly areas in the western portions of the state. These effects included significant rainfall values totaling between 5 and 6 inches near the Mississippi state line and high winds with gusts recorded to be 68 MPH out of Vance, Alabama. The rain and winds resulted in thousands of fallen trees and downed power lines. Power outages lasted from a few days to a week or more, and Alabama Power reported Katrina to be the worst storm in their history for statewide damage and power outages. Additionally, minor damages occurred to some structures throughout the area. In Alabama, six tornados also stemmed from Katrina, four of which were F-0 and two that were F-1. In Greene County, Extensive tree and power line damage occurred during Katrina. Numerous structures, homes and vehicles were damaged. Power outages were widespread and lengthy and affected the entire county. Many businesses suffered significant damage. Greene County suffered \$1.8 million in property damages. (*Source: NOAA NCDC*)

As a Category 3 Hurricane, Dennis came ashore at Navarre Beach in the Florida Panhandle around 2 p.m. on July 10, 2005. Dennis brought with him sustained wind speed at 135 MPH and estimated storm surges of 10-15 feet. The National Weather Service issued an inland hurricane warning which indicated areas would experience substantial winds in excess of 74 MPH with gusts up to 90 MPH. The hurricane downgraded to a Tropical Storm produced 5-10 inches of rain throughout Alabama. President Bush approved a disaster declaration to provide infrastructure assistance to governments in counties across Alabama, making them eligible to receive federal and state assistance to recover costs of debris removal operations and emergency protective measures. Hundreds of trees and power lines were blown down countywide during Dennis. At least three homes suffered wind damage and at least 1100 customers were without power for several hours. County Roads 148 and 20 and State Highways 11, 43 and 14 were temporarily closed due to fallen trees. A mobile home in Forkland was burned after a power pole fell on the home. A motorist ran into a downed tree in Boligee, but was not injured. Property damages totaled \$165,000 in Greene County. (*Source: NOAA NCDC*).

On August 23, 2008, Tropical Storm Fay weakened to a Tropical Depression after it made its final landfall on the Florida Panhandle and entered Southern Alabama. No fatalities, injuries, property or crop damages were reported in Greene County. Trees and power lines were blown down by the winds, resulting in power outages. (*Source: NOAA NCDC*)

On November 9-11, 2009, very heavy rain and gusty winds were experienced by a large portion of Central Alabama. The effects of what was once Hurricane Ida, but had weakened into a Tropical Depression, were felt with nearly everyone across Central Alabama seeing at least 3 inches of rain. Sustained winds around Central Alabama maxed out between 20 and 30 mph, with peak wind gusts generally between 30 and 40 mph. These winds blew down a few trees around the area, especially shallow rooted trees where the saturated soil likely played a significant role. Greene County suffered \$1,000 in property damages. (*Source: NOAA NCDC*)

Greene County experienced a high wind event on September 16, 2004 that resulted in \$5 million property damages and \$75,000 crop damages. No injuries or fatalities were reported. Winds up to 89 miles per hour/77 knots were felt. Thousands of trees and power lines were blown down countywide. At least 3,300 customers were without power at the height of the storm. Power was not restored to some locations for a week. Twenty five to fifty homes suffered significant damage and many more sustained minor roof damage.

Tropical Storm Arlene formed late on Wednesday, June 8, 2005. The system developed off the coast of Honduras in the Western Caribbean and moved generally north northwest. The storm grazed the tip of Western Cuba on Friday, June 10, 2005 and then entered the Gulf of Mexico, with winds sustained around 70 miles an hour. Arlene weakened just before it reached the United States mainland and did not reach hurricane force. Arlene made landfall as a Tropical Storm on Saturday afternoon, June 11, 2005 just west of Pensacola, Florida. Arlene was downgraded to a Tropical Depression Saturday evening as it entered Central Alabama. Arlene continued northward across Central Alabama through early Sunday morning. Arlene's local effects were rather minor. Storm total rain amounts were generally 2-4 inches. Greene County received winds up to 46 miles an hour/40 knots, mainly associated with stronger outer bands. Several trees and power lines were blown down across Central Alabama as the storm moved through the area. Many thousands of residents were without power for several hours. A few homes suffered minor roof damage. A few cities reported minor urban flooding that lasted only a few hours. The heaviest rain and highest wind gusts were sporadic in nature and area wide. The variability was due to stronger feeder bands and location of the remnant tropical system. Property damages totaled \$5,000 in Greene County. The county experienced two more strong wind events, one on March 28, 2009 resulting in \$5,000 property damages and another on September 5, 2011 resulting in \$8,000 property damages. (*Source: NOAA NCDC*)

Sinkholes/Expansive Soils

While sinkholes are possible throughout a large part of Greene County, there have been no sinkholes reported. The impacts of a potential event are damage to property, infrastructure, or roadways. Areas of denser development, such as the City of Eutaw, could experience more significant impact and loss due to increased number and concentration of structures and associated utility services. According to the October 2010 Alabama Geological Survey (**Figure 3-3**), Greene County has experienced sinkhole events.

During the Risk Assessment, it was determined that expansive soils were not a significant threat to the county due to the limited adverse effects and shrink-swell potential of soils in the county.

Landslides

Like sinkholes, landslides are possible in Greene County, but none has been reported. The potential impacts are property damage, impassable roads, sediment erosion, and possible infrastructure damages. No jurisdiction in the county identified landslides as a hazard.

Earthquakes

While earthquakes can and do occur in Greene County, their impact has historically been minimal and insignificant. The highest magnitude event, at 4.3 on the Richter scale, which occurred on November 7, 2004 near the Braggville Community, did not result in any damages or injuries. The built environment, including underground infrastructure, is most likely to be impacted; however, earthquakes can trigger other natural disasters such as landslides and sinkholes. Two more earthquakes occurred during the plan's study period: one on March 9, 2004 in Union with a 2.6 magnitude and another on May 16, 2006 in the Mt. Hebron Community with a 2.5 magnitude. No injuries, deaths, property or crop damages were reported.

Wildfires

Greene County has a significant amount of acreage that is comprised of forestland and is therefore vulnerable to wildfires, especially during times of drought. Both rural and urban

areas in all jurisdictions are impacted by wildfires and result in loss of wilderness, crops, livestock and other property. Loss of human life, both residents and firefighters, is also possible. The timber industry is very prominent and timber crops could be significantly impacted in this county. Greene County experienced 54 wildfires from 2010 - 2013 resulting in 604 acres burned.

Dam and levee failures

According to *HAZUS MH 2.1*, Greene County has 69 High Density Polyethylene (HPDE - Earth) Dams, including one high hazard dam (Howell Heflin Lock and Dam), 3 significant risk dams, and 65 low risk dams. No historical records are available of dam/levee failures in Greene County. One dam located in Boligee is the only one within a municipality; all others are in the rural areas of the county. The impact of a dam failure in the county is low given their location in remote areas with little residential occupancy. Potential impacts would be limited or unregulated water flow, associated damages to property and crops, and a potential increase in waterborne disease. The risks associated with dam/levee failures are the same as those risks associated with flooding. All but one of the jurisdictions identified Dam and Levee Failure as a hazard. There have been no significant dam or levee failures reported in Greene County during 2003 - 2013.

Man-made hazards (no updates have been made to this section since the 2009 plan revision)

The very nature of man-made hazards makes it difficult to foresee, or effectively mitigate, their occurrence. All of the man-made hazards profiled in the plan are possible, no matter how unlikely they are to actually occur. Events that did occur in Greene County were limited to hazardous material releases and impacted the City of Eutaw, Town of Boligee, and the Mt. Hebron areas. All municipalities and rural areas include roads or rail lines that could be impacted by an event. Potential impacts include loss of life and property and the disruption of transportation networks and public services.

Socially Vulnerable Populations

Certain populations are generally more affected by hazard events. These populations can be

defined in terms of social, racial, and economic characteristics. Data provided in the section was obtained from 2010 Census using breakouts for entire municipalities and census tracts.

Table 4-2 shows the county's population characteristics by jurisdiction and by census tract. The City of Aliceville is the most populated jurisdiction, followed by the Towns of Gordo, Carrollton, and Reform. The county has three census tracts (See **Map 4-1**). In terms of vulnerability, the larger the population of an area the more people and structures that could possibly be damaged or destroyed. Tract 601 is the most populated tract and includes the City of Eutaw. Tract 602 is the second most populated tract and includes the Towns of Boligee and Forkland. Tract 600 is the least populated tract and includes Mt. Hebron.

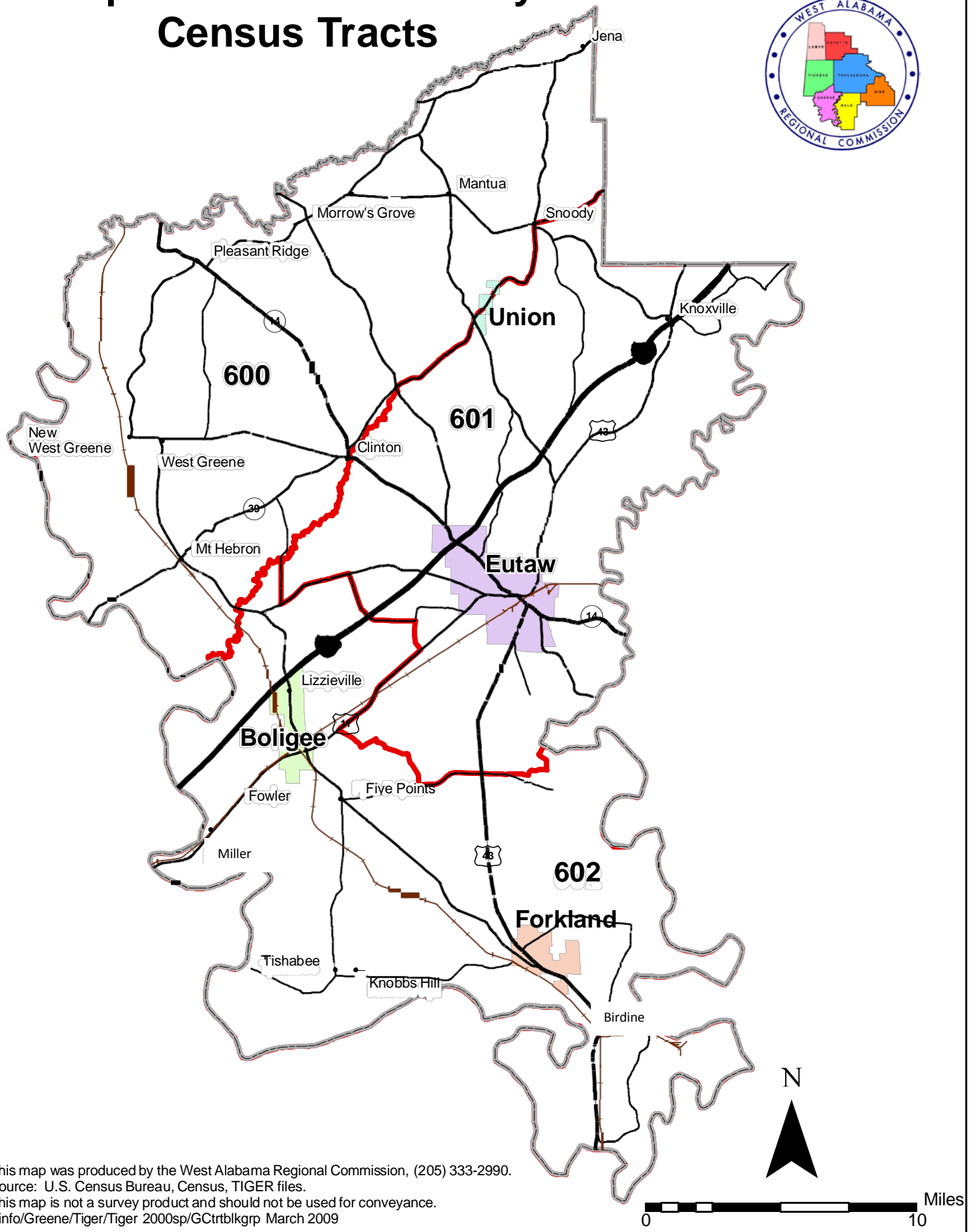
Minority populations are generally considered to be more vulnerable. These populations may not have the resources necessary to recover as quickly or completely from disasters. Minorities generally have higher percentages of inadequate medical insurance, inadequate home insurance, and homes that may be deemed as substandard housing.

Populations over sixty-five years of age and those under eighteen years of age are more vulnerable than other population groups. These groups are at higher risk for injury and medical complications that may occur during or as a result of a disaster. These special needs populations may require more attention during evacuation and may require special shelters.

Table 4-1: Greene County Population Characteristics

Geographic Area	<i>Population</i>	<i>Race-White</i>	<i>Race-Black</i>	<i>Race-Other*</i>	<i>Under 18 years</i>	<i>Age 18-64 years</i>	<i>Age 65 and Over</i>
Greene County	9,045	1,575	7,370	169	2,635	8,319	1,454
Boligee	328	29	296	3	94	189	45
Eutaw	2,934	530	2,353	51	758	1683	493
Forkland	649	77	567	5	159	398	92
Union	237	8	226	3	48	138	51
Unincorporated area	4,897	931	928	134	1,576	5,911	773
Census Tracts							
600	1,814	309	1,489	16	415	1,067	332
601	4,410	807	3,544	59	1,068	2,558	784
602	2,821	459	2,337	25	711	1,726	384
<i>(Source: 2010 Census)</i>							

Map 4-1: Greene County Census Tracts



This map was produced by the West Alabama Regional Commission, (205) 333-2990.
 Source: U.S. Census Bureau, Census, TIGER files.
 This map is not a survey product and should not be used for conveyance.
 Ainfo/Greene/Tiger/Tiger 2000sp/GCrttblkgrp March 2009

In addition to the racial and age composition within the county, income levels are important when identifying vulnerable populations. Lower income individuals may not have the resources to prepare for or recover from disasters. **Table 4-3** shows the median household income, per capita income, and poverty level data for the jurisdictions and census tracts in Greene County.

The median household income for the State of Alabama is \$43,160. The median household income for the United States is \$53,046. No municipality has a median household income that equals or exceeds either the state or national average. (*Sources: 2010 Census; www.usa.com; www.easidemographics.com*)

Per capita income is the average obtained by dividing aggregate income by the total population of an area. The per capita income for the State of Alabama is \$23,587. The per capita income for the United States is \$28,051. No municipality has a per capita income that equals or exceeds either the state or national average. (*Sources: 2010 Census; www.usa.com; www.easidemographics.com*)

The percent of persons below the poverty level in the State of Alabama is 18.1%. The corresponding rate for the United States is 14.9%. The entire county is above both of these rates. Tract 602 at 35.4% and the Town of Boligee at 59.1% has the highest poverty rates in the county. (*Sources: 2010 Census; www.usa.com; www.easidemographics.com*)

Table 4-2: Greene County Income Data

Geographic Area	Median Household Income	Per Capita Income	Persons Below Poverty Level	Percent Below Poverty Level
Greene County	\$30,525	\$14,825	2,976	32.9%
Boligee	\$12,181	\$22,042	194	59.1%
Eutaw	\$37,125	\$13,827	766	26.1%
Forkland	\$23,077	\$10,237	330	50.9%
Union	\$28,864	\$12,873	73	30.9%
Census Tracts				
600	\$28,077	\$13,385	560	31.6%
601	\$28,494	\$15,919	1,295	29.9%
602	\$23,839	\$11,618	56	35.4%
<i>(Sources: 2010 Census; www.usa.com)</i>				

Vulnerable Structures

Housing is an important consideration of mitigation planning. The concentration and the type of housing are two primary factors. In Greene County there are a total of 5,017 housing units. **Table 4-4** shows the housing characteristics of the county by jurisdiction.

The City of Eutaw has the greatest concentration of housing units, followed by the Towns of Forkland, Boligee, and Union. The Town of Forkland has the highest number and percent of mobile home units within a municipality. Mobile home units are historically very vulnerable to a variety of hazards and prone to high amounts of damage and complete destruction.

Table 4-3: Greene County Housing Characteristics			
Geographic Area	Total Housing Units	Mobile Home Units	Mobile Home %
Greene County	5,017	1,602	32.0%
Boligee	294	64	22.0%
Eutaw	1,262	88	7.0%
Forkland	367	176	48.0%
Union	156	74	47.0%
<i>(Sources: 2010 Census; usa.com)</i>			

Table 4-5 shows the building stock in Greene County by general occupancy. The data provides the number of buildings by use and is shown by census tract. According to this data, provided by *HAZUS-MH 2.1* software, Tract 601 has the highest number of structures in the county. Complementing this information is **Table 4-6** that provides the value totals for these building types and **Table 4-7** that provides the content value for these building types, each table is shown by Census Tract. Tract 601 also has the highest total value for structures in the county.

Table 4-4: Greene County Building Stock by General Occupancy								
Tract	Residential	Commercial	Industrial	Agriculture	Religious	Government	Education	Building Count
600	967	12	4	3	4	3	0	993
601	2,623	77	16	6	11	2	4	2,739
602	1,994	15	9	2	6	4	0	2,030
Total	5,584	104	29	11	21	9	4	5,762
<i>(Source: HAZUS-MH 2.1)</i>								

Table 4-5A: Greene County Building Exposure*(Numbers shown in thousands of dollars)*

Tract	Residential	Commercial	Industrial	Agriculture	Religious	Government	Education	Total Exposure
600	\$54,618	\$4,998	\$9,490	\$344	\$1,636	\$1,154	\$0	\$72,240
601	\$151,260	\$24,286	\$4,980	\$538	\$5,166	\$3,690	\$3,250	\$193,170
602	\$101,179	\$4,138	\$4,087	\$792	\$4,091	\$2,426	\$4,214	\$120,927
Total	\$307,057	\$33,422	\$18,557	\$1,674	\$10,893	\$7,270	\$7,464	\$386,337

*(Source: HAZUS-MH 2.1)***Table 4-5B: Greene County Building Contents Exposure***(Numbers shown in thousands of dollars)*

Tract	Residential	Commercial	Industrial	Agriculture	Religious	Government	Education	Total Exposure
600	\$27,363	\$4,998	\$14,236	\$344	\$1,636	\$1,514	\$0	\$50,091
601	\$75,849	\$25,549	\$7,176	\$538	\$5,166	\$4,533	\$3,250	\$122,061
602	\$50,787	\$4,245	\$5,116	\$792	\$4,091	\$3,385	\$4,214	\$72,630
Total	\$153,999	\$34,792	\$26,528	\$1,674	\$10,893	\$9,432	\$7,464	\$244,782

(Source: HAZUS-MH 2.1)

Critical Facility Inventory

Critical facilities are crucial to the daily operation of Greene County. Critical facilities help maintain a certain quality of life. Loss of operation could result in severe impacts on the community. Each of the critical facilities listed in **Table 4-8** is vulnerable to each of the hazards identified in the risk assessment. Critical facilities include but are not limited to the following:

- Governmental services
- Police and Fire Departments
- Public Works
- Education
- Industrial
- Medical

Each jurisdiction listed facilities based on the location of the facility without

regard to ownership or function. The Greene County Courthouse, for example, is shown on the City of Eutaw's list based on its location in the city. The county's list will show only what is located in the unincorporated areas. Each jurisdiction also provided addresses and approximate values for the facilities listed, using replacement values from their insurance policies when available. *HAZUS-MH 2.1* was also utilized for building and content values.

Critical facilities were reviewed to consider vulnerability to special flood hazard areas. The determination utilized the review of existing FIRMs or FHBMs. No critical facilities in Greene County were identified as being in a special flood hazard area and particularly vulnerable to floods.

New critical facilities scheduled for construction include a training and office complex for the Greene County Fire Association. The building will be located on Prairie Avenue in the City of Eutaw and will also house the County EMA office. The Facility is expected to be complete in 2010. Construction of other critical facilities and infrastructure will follow future development.

TABLE 4-6: Greene County Critical Facilities-Unincorporated Areas

	Location	Area	Use	Value
Governmental Services				
Dollarhide VFD	Co. Rd. 150	Dollarhide	Fire Fighting & Rescue	\$1,000,000
Knoxville VFD	CR 217	Knoxville	Fire Fighting & Rescue	\$1,000,000
Mantua-Lewiston VFD	Lewiston Rd	Mantua-Lewiston	Fire Fighting & Rescue	\$1,000,000
Springfield VFD	CR 208/Union Rd	Springfield	Fire Fighting & Rescue	\$1,000,000
Tishabee VFD	CR 70	Tishabee	Fire Fighting & Rescue	\$1,000,000
West Greene VFD	Hwy 14	West Greene	Fire Fighting & Rescue	\$1,000,000
Lower Gainesville VFD	CR 131 & 133	Lower Gainesville	Fire Fighting & Rescue	\$1,000,000
Steam Plant Rd VFD	CR 18	Steam plant	Fire Fighting & Rescue	\$1,000,000
Greene County Sheriff's Department	400 Morrow Ave.	Eutaw	Law Enforcement	\$1,260,000
Public Works				
Well and Treatment /Generator	CR 18 North	Burdine	Water Supply	\$650,000
Tank (500,000 gal)	CR 48	Cooks Hill	Water storage	350,000
Tank (200,000 gal - Elev)	CR 18 South		Water storage	400,000
Tank (250,000 gal)	CR 117	Mt Hebron	Water storage	250,000
Booster Pump St#1/Generator	CR 20 S		Water supply	120,000
Booster Pump St#2/Generator	CR 20 N		Water supply	115,000
Chlorine Station @ Booster #2	CR 20 N		Treatment	25,000
Sewer Lagoon	CR 208	Springfield	Wastewater Treatment	600,000
Sewer Pump Station/Generator	Hwy 11	Springfield	Sewer	150,000
Well (Fosters/Ralph System)	CR 181/60	Lewiston	Water Supply	350,000
Water Tank (Fosters/Ralph)	Esma Thompson Rd		Water storage	255,800
Sewer Meter (Boligee/Eutaw)	I20/59	Crossroads Ind Pk	Sewer	25,000
Eutaw Booster Pump Station	Rest Area		Water System	30,000
Eutaw Booster Pump Station	Lower Gainesville Rd		Water System	30,000
Eutaw Booster Pump Station		BP store in Boligee	Water System	30,000
Eutaw Water Tank #4	Lower Gainesville Rd		Water System	450,000
Eutaw Well #4	Lower Gainesville Rd		Water System	250,000
Eutaw Well #5	Lower Gainesville Rd		Water System	250,000
Education				
Lighthouse Christian School		Clinton	Education	\$112,290
Industrial				
Greenetrack	Co. Rd. 208	Springfield	Major Employer	20,000,000
Teppco	Crossroads Ind Pk	I20/59	Major Employer -New	
Greene County Steam Plant	Steam Plant Rd			
Miscellaneous				
Cell Towers (16)	Various locations	County	Communications	50,000,000
Source: Local Jurisdictions				Total \$82,703,090

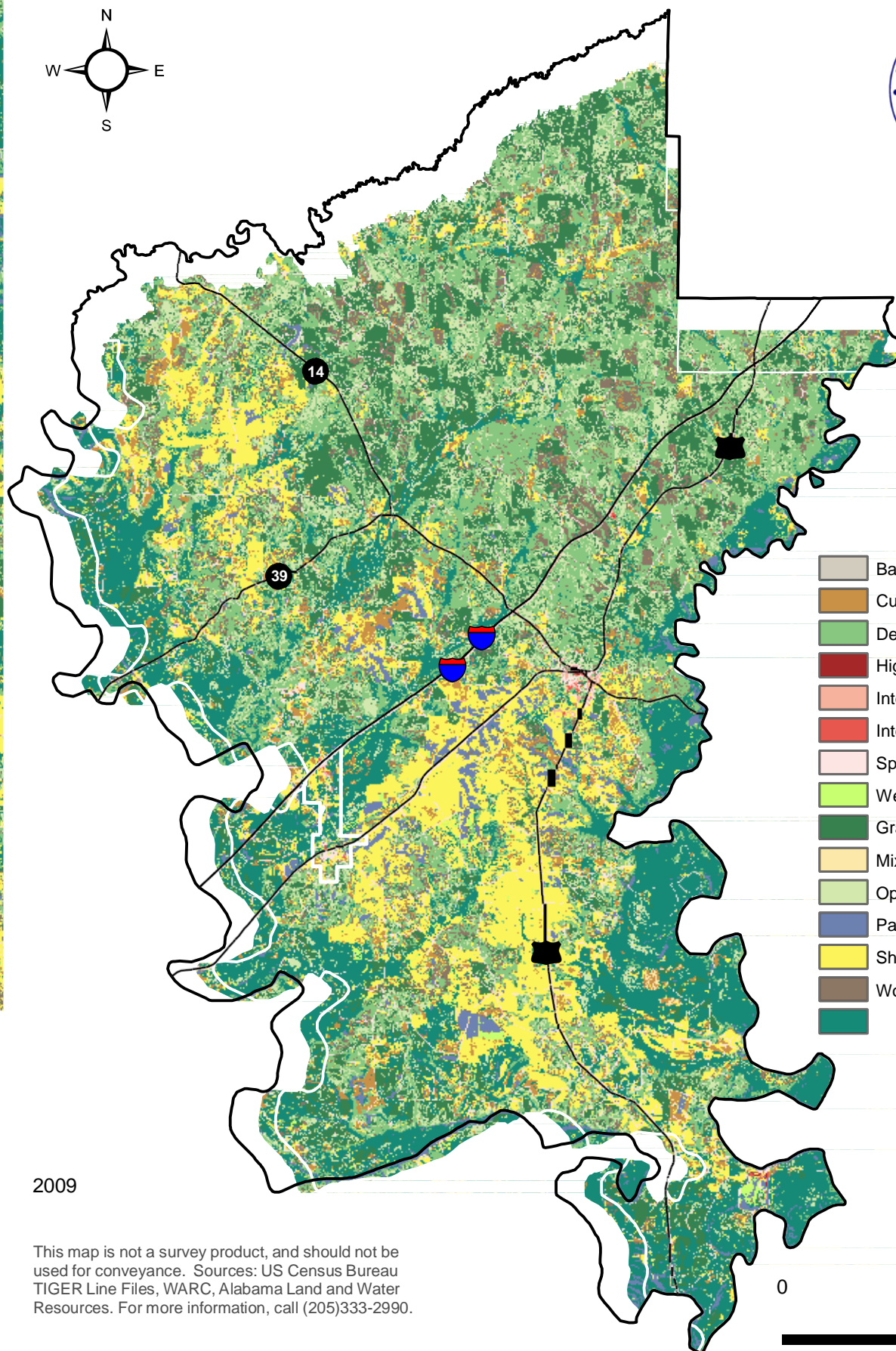
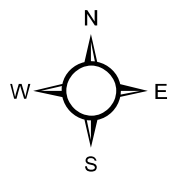
Development Trends

Greene County is a mostly rural area with large stretches of vegetation. There has been little change in land use in this area for many years, except for a recent trend towards Catfish Farming. The 2010 Census for Greene County, Alabama shows a countywide population of 9,045. Current population projection numbers show that the population in Greene County will continue decreasing within the next 20 years. There is a population change of -1,439 from 2010 to 2035, which is a 15% population decrease. **Table 4-9** provides the population projections for Greene County.

Table 4-7: Greene County Population Projections	
YEAR	POPULATION PROJECTION
2015	8,722
2020	8,431
2025	8,156
2030	7,880
2035	7,606
<i>(Source: Center for Business and Economic Research, University of Alabama; Alabama Hazard Mitigation Plan)</i>	

The development trends in the county do not indicate any marked increase in vulnerability to the identified hazards. During the plan update the land use patterns were reviewed and it was determined that there have been no changes since the original plan. Additionally, no known or anticipated annexations by municipalities were identified during the plan update. Based on population projections and local development trends, development is expected to remain consistent within existing patterns. Development at the two major interchanges on Interstate 20/59 is expected to continue. Currently there are no planned annexations by municipalities.

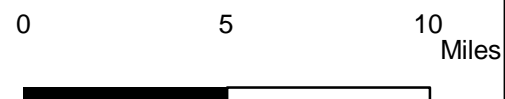
Map 4-2: Greene County Land Use Land Cover



- Barren Land (Rock/Sand/Clay)
- Cultivated Crops
- Deciduous Forest Developed,
- High Intensity Developed, Low
- Intensity Developed, Medium
- Intensity Developed, Open
- Space Emergent Herbaceous
- Wetlands Evergreen Forest
- Grassland/Herbaceous
- Mixed Forest
- Open Water
- Pasture/Hay
- Shrub/Scrub
- Woody Wetlands
-

2009

This map is not a survey product, and should not be used for conveyance. Sources: US Census Bureau TIGER Line Files, WARC, Alabama Land and Water Resources. For more information, call (205)333-2990.



Methods of Warning

Greene County Emergency Management Agency and the county's jurisdictions have constructed a warning system that provides multiple ways to receive weather watches, warnings, and other emergency messages.

NOAA Weather Radio

NOAA Weather Radio is a nationwide network of radio stations broadcasting weather and other emergency information 24 hours a day. All National Weather Service-issued watches, warnings, forecasts and other emergency messages are broadcast on one of seven frequencies. National Weather Service personnel at offices in Birmingham record weather information that plays in a cyclical pattern repeating every three to six minutes. Broadcasts generally include local area five-day forecasts, current weather conditions, radar reports, weather summaries, climatic data, river and lake stage readings, and other weather information. The broadcasts are continuously updated to provide the listener with the latest information.

NOAA Weather Radio is useful any time for the latest weather information but becomes even more important during severe or hazardous weather. During episodes of severe weather, the normal broadcast cycle is interrupted and focus shifted to the local severe weather threat. Watches, warnings, and statements are given the highest priority and are updated frequently as conditions change.

In an emergency, each transmitter is capable of transmitting a warning alarm tone signal and the new Specific Area Message Encoding (SAME) signal, followed by information on the emergency situation. These signals will activate specially designed receivers, either bringing up the volume or producing a visual and/or audible alarm. Not all weather band receivers have this capability, but all radios that receive NOAA Weather Radio transmissions can receive the emergency broadcasts. The warning alarm device is tested each Wednesday, between 11 am and noon, weather permitting.

Outdoor Warning Sirens

Greene County EMA has four outdoor warning sirens in place. Although these sirens are located in each of the municipalities and cover most of the populated areas, there are many places without an outdoor siren. **Figure 4-2** shows the existing sirens identified by number, location and audible buffer radius. **Table 4-8** lists the existing sirens and is keyed to **Figure 4-2** for reference.

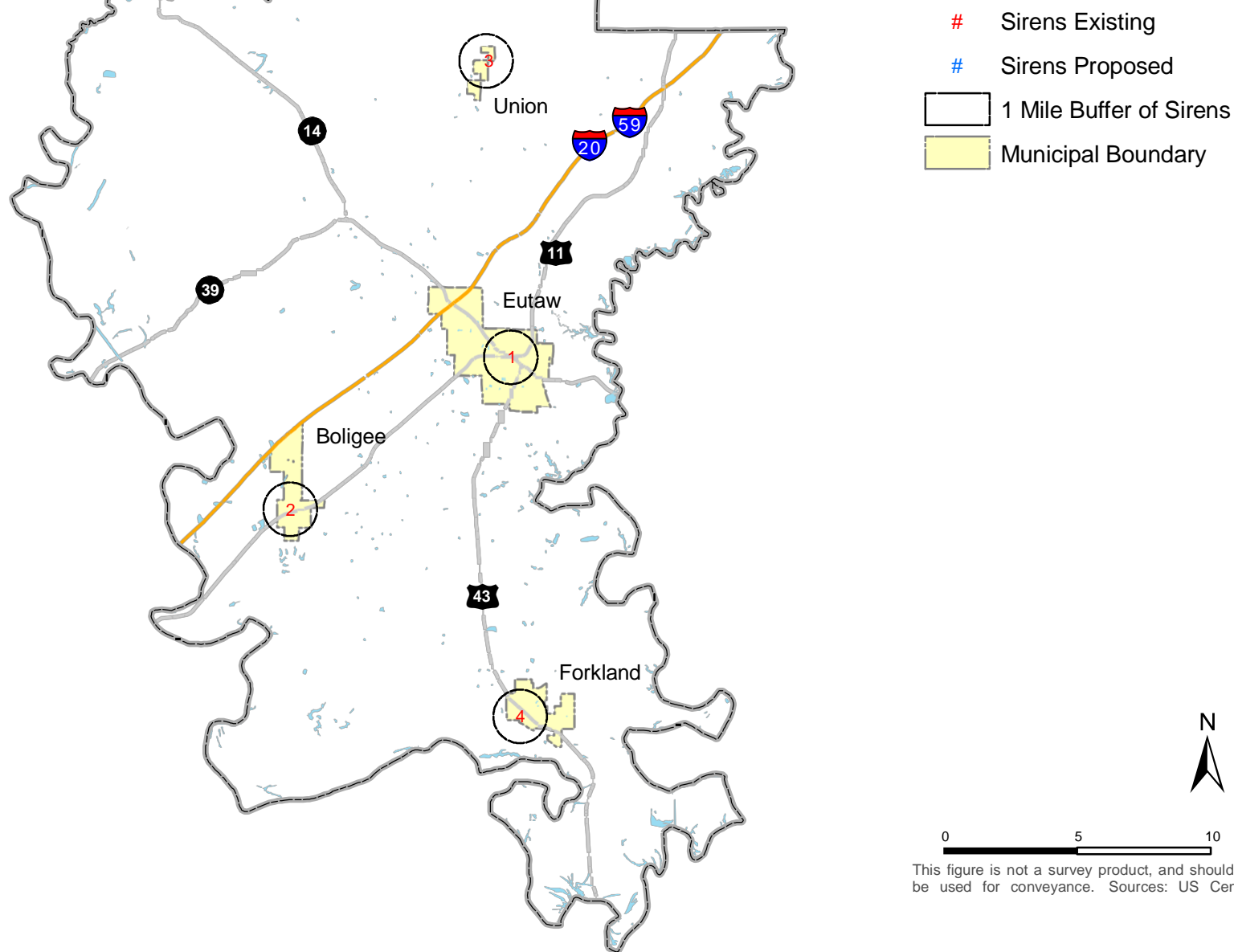
The existing sirens have an effective radiated coverage area of one mile around the siren. The sirens are activated only for Thunderstorm and Tornado Warnings but will be used to notify the public of Hazardous Materials Incidents in the near future. There is no ALL CLEAR siren sounding due to the possibility of public confusion. Weather Warnings sound like a long wail while Hazardous Material Alerts will have a distinct sound when the program goes on line. The siren blasts run three to five minutes. The sirens are activated from the Greene County E-911 Office. Activations may be completed in three separate south to north groupings or via the entire system simultaneously.

The entire countywide Outdoor Siren Warning System is periodically tested. Notification of testing is usually posted in the newspapers to avoid confusion. The general public is advised to not depend on hearing the sirens inside a building. The sirens are designed to be heard outdoors only and are installed near recreational areas and shopping malls where there are large outdoor populations. As a backup to the Outdoor Siren Warning System, police and fire units throughout the county can be instructed to sound their sirens.

TABLE 4-8: Greene County Outdoor Warning Sirens				
Number	Jurisdiction	Address	Latitude	Longitude
1	Eutaw	116 Main St	32.7569	-88.0278
2	Boligee	Constantine/US Hwy 11	32.8398	-87.8867
3	Union	7856 CR 191	32.6452	-87.8799
4	Forkland	13327 US 43N	33.0004	-87.9033
*All sirens have a one mile audible radius				
<i>(Source: Participating Jurisdictions)</i>				



Figure 4-2: Greene County Outdoor Warning System



2008

N
0 5 10 M
This figure is not a survey product, and should not be used for conveyance. Sources: US Census

Broadcast Media

One of the key elements of the Countywide Warning System is broadcast media. Most of the radio, television, and cable companies that serve Greene County residents are dedicated to informing their audiences of impending emergencies. These broadcasters have partnered with the Greene County Emergency Management Agency to bring their listeners and viewers fast, accurate, and important severe weather and civil emergency information via EAS and traditional newsgathering methods. Most of the television stations serving the Greene County market (ABC 33/40, CBS 42, NBC 13, and Fox 6) feature live Doppler radar and certificated meteorologists. Many of the radio stations do continuous severe weather coverage.

Vulnerability Summary

Table 4-12 provides a summary of Greene County’s vulnerability to specified hazards by jurisdiction. Each jurisdiction was tasked with considering how vulnerable they are to each hazard by considering the percentage of potential damage and the frequency of occurrences. Using information from the Risk Assessment in Section Three as well as the data in the earlier parts of this section as a basis for evaluation, the committee members assigned either N/A: Not applicable, L: Low risk, M: Medium Risk, and H: High Risk as defined in the Table Key.

Estimated Loss Projections

Table 4-11 shows the figures used for valuation of deaths and injuries are approximations based on FEMA guidance used in benefit-cost analysis of hazard mitigation measures. Major and minor injuries are combined in the NOAA data, so it was necessary to use a blended number in the valuation.

Table 4-13 shows the estimated loss projections for each hazard. The average number of occurrences per year is shown along with total number of deaths and injuries. The average amount of loss per event was determined by combining crop and property loss damages for each event type and then dividing by the corresponding total number of events reported during the ten-year study period. This amount is shown under the column heading Average Crop and Property Loss. There are instances where the Average Crop and Property Loss (per event) and Projected Loss (per Event) for an identified hazard could not be determined due to the absence of historical event data. This is a data limitation beyond the control of an affected jurisdiction.

Table 4-9: 2014 Values used for Monetary Conversion of Tornado Injuries and Deaths	
Damage Category	Value
Injury (blended major and minor)	\$23,175
Death	\$3,660,003
<i>(Source: FEMA)</i>	

The Projected Loss is shown per event by hazard type. Due to the fluctuations in the value of a dollar over the ten-year study period, the year 2008 was chosen as a midpoint year. The Projected Loss was then calculated by adjusting the 2008 value of \$1 up to \$1.09, a 9 % increase to reflect the value of the dollar in 2014. Average loss amounts were increased by 9% to achieve a 2014 value for an estimated projected loss per event occurrence. *(Source: U. S. Inflation Calculator based on the U. S. Government Consumer Price Index Data)*

Table 4-10: Greene County Vulnerability Summary

Natural Hazards	Boligee	Eutaw	Forkland	Union	Unincorporated County
Thunderstorm	H	H	H	H	H
Lightning	M	M	M	H	H
Hail	H	M	M	H	M
Tornado	M	H	H	H	H
Flood/Flash Flood	M	M	M	L	M
Drought/Extreme Heat	M	H	M	M	H
Winter Storm/Frost Freeze/ Heavy Snow/ Ice Storm/Winter Weather/Extreme Cold	L	M	M	L	M
Hurricane/Tropical Storm/ Tropical Depression/High Wind/Strong Wind	L	H	M	L	H
Sinkhole/Expansive Soil	L	L	L	L	L
Landslide	N/A	N/A	N/A	N/A	N/A
Earthquake	M	L	M	M	L
Wildfire	L	M	M	L	M
Dam/Levee Failure	L	L	L	N/A	L
Man-Made Hazards					
Hazardous Material Release	H	H	H	L	M
Arson/Incendiary Attack	M	L	M	M	M
Armed Attack	L	M	L	L	L
Conventional Bomb	L	M	L	L	L
Chemical Agent	L	M	L	L	M
Cyberterrorism	L	L	L	L	L
Agriterrorism	L	L	L	L	L
Biological Agent	L	M	M	L	L
Radiological Agent	L	M	M	L	L
Nuclear Bomb	L	L	L	L	L
<p>KEY:</p> <p>NA – Not Applicable; not a hazard to the jurisdiction</p> <p>L – Low Risk; little damage potential (damage to less than 5% of the jurisdiction)</p> <p>M – Medium Risk; moderate damage potential (damage to 5-10% of jurisdiction, infrequent occurrence)</p> <p>H – High Risk; significant risk/major damage potential (damage to over 10% of jurisdiction, regular occurrence)</p>					
<i>(Source: Participating Jurisdictions)</i>					

**Table 4-11: Greene County
Estimated Loss Projections from Specified Hazards**

Natural Hazards	Average Occurrences (per year)	Total Deaths	Total Injuries	Average Death and Injury Loss (per event)	Average Crop and Property Loss (per event)	Projected Loss (per event)
Thunderstorm	2.8	0	0	Unknown	\$10,661	\$11,621
Lightning	Unknown	0	0	Unknown	Unknown	Unknown
Hail	2.7	0	0	Unknown	\$4, 852	\$5,289
Tornado	0.9	0	2	\$5,150	\$945,000	\$1,035,664
Flood/Flash Flood	1.0	0	0	Unknown	\$7,300	\$7,957
Drought/Extreme Heat	1.5	0	0	Unknown	Unknown	Unknown
Winter Storm/Frost Freeze/ Heavy Snow/Ice Storm/Winter Weather/ Extreme Cold	0.7	0	0	Unknown	Unknown	Unknown
Hurricane/Tropical Storm/ Tropical Depression/High Wind/ Strong Wind	0.8	0	0	Unknown	\$882,375	\$961,789
Sinkhole/Expansive Soil	Unknown	0	0	Unknown	Unknown	Unknown
Landslide	Unknown	0	0	Unknown	Unknown	Unknown
Earthquake	0.3	0	0	Unknown	Unknown	Unknown
Wildfire (3 year study period)	18.0	0	0	Unknown	\$376,200	\$410,058
Dam/Levee Failure	Unknown	0	0	Unknown	Unknown	Unknown

Sources: NOAA NCDC; U. S. Inflation Calculator/Consumer Price Index; Local Input; USDA Census of Agriculture; Alabama Forestry Commission and National Forestry Service; Alabama Geological Survey

Methodology: Average occurrences were expressed annually by dividing the total number of occurrences by the ten-year period. Deaths and injuries were taken from the hazard event data. Average losses were calculated by dividing the total amount of all damages by the total number of occurrences during the ten-year period with the exception of wildfire which is a 3-year period (average # fires per year x average fire size in acres x \$1,900/acre average). Projected loss expresses an estimated damage amount per future occurrence by converting the average loss figure from a midpoint of 2008 dollars to 2014 dollars (\$1 in 2008 = \$1.09 in 2014...a cumulative rate of inflation of 9%). Zero denotes no data available to determine the average occurrences, average loss or projected loss per event.

Mitigating Potential Losses

The Hazard Mitigation Planning Committee set forth mitigation goals and objectives for the county and its jurisdictions. Each jurisdiction set forth their own mitigation action plans located in Section Five.

Mitigation Strategy

In the preparation of the mitigation strategy, the Hazard Mitigation Planning Committee reviewed the goals and objectives of the 2009 plan revision. The committee agreed the goals and objectives would remain the same for this plan revision.

Mitigation Actions

Mitigation ideas can be found on the FEMA.gov website. FEMA summarizes mitigation actions into four types: Local Planning and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, Education and Awareness.

Jurisdictions sought and selected their own mitigation actions to support the goals and objectives of the mitigation strategy. The identification of mitigation actions has been shaped by the events that occurred over the past five years, vulnerabilities, and available mitigation actions. Each significant event revealed strengths and weaknesses within the hazard mitigation program; therefore, jurisdictions adjusted their mitigation actions to address these weaknesses accordingly. Because of these events, the prioritization of actions has been re-evaluated and ranked as follows:

Actions identify the activity, what hazard(s) are addressed, whether the activity applies to a new or existing asset, and an estimated cost. The action also identifies the planning mechanism, possible funding sources, and a time frame for completion of the activity.

Action Priority and Cost Benefit Review

In the selection and prioritization of mitigation actions, each member was asked to consider the following: funding options, political support, public support, legality, preservation of the environment, and staff capability. The committee then looked at each strategy in terms of costs and benefits. Not only were direct costs and benefits considered, but indirect costs and benefits were also acknowledged. Indirect costs and/or benefits are often intangible attributes such as social effects.

Priority mitigation actions will be implemented only if they are cost beneficial; maximum benefits must outweigh the associated costs of the proposed actions. The committee performed a general evaluation of each mitigation measure which might require FEMA funds. The committee weighed the estimated costs for each mitigation measure against the projected benefits of the action. A more detailed benefit-cost analysis will be required for each priority action to determine economic feasibility during the project planning phase. Projects will also require a more detailed evaluation for eligibility and feasibility including social impact, environmental impact, technical feasibility, and other criteria that measure project effectiveness. This detailed evaluation of projects will be performed in the pre-application phase of a grant request. Further, implementation of actions will be subject to the availability of FEMA grants and other sources of funding from year-to-year.

Mitigation Status

During the plan update mitigation actions were reviewed in order to identify completed, deferred, or deleted actions from the previous plan and incorporate actions added during annual updates. **Table 4-14** shows Greene County's updated mitigation actions. One new action was identified during the plan update process. In the 2009 plan revision, priorities were expressed by numbering 1 as the highest priority – the higher the number, the lower the priority. For this plan revision, the committee decided to assign a new prioritization labeling as one project may be equally as important as another project. As a result, projects will be labeled high, medium, and low in priority.

BENCHMARKING:

Greene County Mitigation Action Plan (2009)

1. Install additional outdoor warning sirens throughout county – *Action is ongoing*
 - During the past five years, the following outdoor warning sirens have been installed: One in Boligee, Forkland, and Union and three in Eutaw. Installation is in process on the following outdoor warning sirens: One in Eutaw, Boligee, Forkland, and the rural area of Mantua/Lewiston.
2. Construct long-term storm shelter to include running water, kitchen and back-up generator – *Action revised and is ongoing*

- The following long-term community safe room installations are in process: One in Eutaw, Boligee, Forkland, and the rural area of Mantua/Lewiston.
3. Construct short-term shelters at fire departments – *Action revised and is ongoing*
 - The county has completed 8 short-term individual storm shelters and 10 more are in progress.
 4. Replace portable classrooms with permanent construction – *Action deleted as it is not an applicable action item for the HMPG*
 5. Provide emergency generators at critical facilities – *Action is ongoing*
 - During the past five years, the county installed one emergency generator at the community safe room located at the Eutaw Activity Center.
 6. Install security measures to critical facilities – *Action is ongoing*
 7. Enforce floodplain management requirements regulate construction or improvements in Special Flood Hazard Areas (SFHAs) – *Action is ongoing*
 8. Build and equip new Emergency Operations Center - *Action deleted as it is not an applicable action item for the HMPG*
 9. Upgrade facilities at volunteer fire departments - *Action is ongoing*
 10. Upgrade and improve drainage systems – *Action revised and is ongoing*

During the plan update process, five actions are ongoing, three were revised and are ongoing, and two were deleted from the plan. A new action to purchase and implement a countywide communications system for first responders will be included in this plan update.

Mitigation Strategy – Greene County

Goal 1: Protect life

Objective 1.1 Improve Warning and Emergency Communication Systems

Action 1.1.1 Install additional outdoor warning sirens throughout county

Objective 1.2 Reduce impact of hazards on vulnerable populations

Action 1.2.1 Install/construct long-term community safe rooms to include generators and outdoor warning sirens, if needed

Action 1.2.2 Install/construct short-term individual shelters at fire departments

Objective 1.3 Improve disaster response and recovery

Goal 2: Protect property

Objective 2.1 Reduce losses to critical facilities/assets

Action 2.1.1 Provide emergency generators at critical facilities

Action 2.1.2 Install security measures to critical facilities

Objective 2.2 Continue Participation in NFIP program

Action 2.2.1 Enforce floodplain management requirements regulate construction or improvements in Special Flood Hazard Areas (SFHAs).

Objective 2.3 Provide and maintain essential public services

Action 2.3.1 Upgrade facilities at volunteer fire departments

Action 2.3.2 Purchase and implement countywide communications system for first responders

Objective 2.4 Reduce losses due to drainage problems

Action 2.4.1 Improve drainage systems

Goal 3: Reduce economic impacts of disasters

Objective 3.1 Maintain operations of critical businesses and major employers

Goal 4: Protect environment and natural resources

Objective 4.1 Identify, protect, and properly manage flood plains

Objective 4.2 Enforce local codes and regulations related to NFIP

Goal 5: Increase public preparedness for disasters

Objective 5.1 Continue to train severe weather spotters

Table 4-12: Greene County Mitigation Actions

Mitigation Action 1.1.1	Install outdoor warning sirens throughout county
Hazard(s) Addressed	All
Applies to new/existing asset	New
Local Planning Mechanism	Greene County EMA
Time frame for Completion	One year from funding availability
Estimated Cost	\$30,000 ea
Funding Sources	Grants, local
Priority	Medium

Mitigation Action 1.2.1	Construct long-term community safe rooms to include generators and outdoor warning sirens if needed
Hazard(s) Addressed	All
Applies to new/existing asset	New
Local Planning Mechanism	Greene County EMA, Greene County
Time frame for Completion	Two years from funding availability
Estimated Cost	\$150,000 each
Funding Sources	Grants, local
Priority	High

Mitigation Action 1.2.2	Construct short-term individual storm shelters at fire departments to include outdoor warning sirens if needed
Hazard(s) Addressed	All
Applies to new/existing asset	New
Local Planning Mechanism	Greene County EMA, individual VFD's
Timeframe for Completion	Two years from funding availability
Estimated Cost	\$50,000 ea
Funding Sources	Grants, local
Priority	High

Mitigation Action 2.1.1	Provide emergency generators to critical facilities
Hazard(s) Addressed	All
Applies to new/existing asset	Existing
Local Planning Mechanism	Greene County EMA, Greene County
Time frame for Completion	One year from funding availability
Estimated Cost	\$25,000 ea
Funding Sources	Grants, local
Priority	Medium

Mitigation Action 2.1.2	Install security measures at critical facilities
Hazard(s) Addressed	Misc Man Made hazards
Applies to new/existing asset	Existing
Local Planning Mechanism	Greene County EMA, Greene County, Fosters/Ralph Water Authority
Time frame for Completion	One year from funding availability
Estimated Cost	\$10,000
Funding Sources	Grants, local
Priority	Medium

Mitigation Action 2.2.1	Enforce floodplain management requirements, regulate construction or improvements in Special Flood Hazard Areas (SFHA's)
Hazard(s) Addressed	Flooding
Applies to new/existing asset	New, existing
Local Planning Mechanism	Greene County EMA, Greene County
Time frame for Completion	One year from funding availability
Estimated Cost	
Funding Sources	Grants, local
Priority	Low

Mitigation Action 2.3.1	Upgrade facilities at volunteer fire departments
Hazard(s) Addressed	All
Applies to new/existing asset	New, existing
Local Planning Mechanism	Greene County EMA, individual VFD's
Time frame for Completion	One year from funding availability
Estimated Cost	\$700,000
Funding Sources	Grants, local
Priority	Low

Mitigation Action 2.3.2	Purchase and implement a countywide communications system for first responders
Hazard(s) Addressed	All
Applies to new/existing asset	New, existing
Local Planning Mechanism	Greene County Commission ; Volunteer Fire Association
Time frame for Completion	One year from funding availability
Estimated Cost	\$200,000
Funding Sources	Grants, local
Priority	High

Mitigation Action 2.4.1	Improve drainage system
Hazard(s) Addressed	Flooding
Applies to new/existing asset	New, existing
Local Planning Mechanism	Greene County EMA, Greene County
Time frame for Completion	One year from funding availability
Estimated Cost	\$300,000
Funding Sources	Grants, local
Priority	Medium

Section Five:

Jurisdiction

Assessments

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Town of Boligee

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**Table 5-1: Town of Boligee
Risk and Vulnerability Overview**

Natural Hazards	Hazard Identification	Prioritized Occurrence Threat	Vulnerability
Thunderstorm	X	6	H
Lightning	X	9	H
Hail	X	7	H
Tornado	X	9	H
Flood/Flash Flood	X	3	M
Drought/Extreme Heat	X	2	H
Winter Storm/Frost Freeze/Heavy Snow/ Ice Storm/Winter Weather/Extreme Cold	X	5	M
Hurricane/Tropical Storm/Tropical Depression/High Wind/Strong Wind	X	4	M
Sinkhole/Expansive Soil	X	9	L
Landslide	N/A	9	N/A
Earthquake	X	8	L
Wildfire	X	1	L
Dam/Levee Failure	X	9	M

Sources: NOAA NCDC Storm Events Database; Alabama Forestry Commission; National Forestry Service; Alabama Geological Survey; Participating Jurisdictions

KEY:

Hazard Identification – Identified by local jurisdictions

Prioritized Occurrence Threat - Hazards are prioritized with the highest threat of occurrence assigned number one based on hazardous events that have occurred within each jurisdiction over the past ten years, with the exception of wildfires that were based on events that have occurred over the past three years. Some natural hazards have equal threats to a jurisdiction; therefore, their threat number will be the same.

Vulnerability – Identified by local jurisdictions. NA – Not Applicable; not a hazard to the jurisdiction; L – Low Risk; little damage potential (damage to less than 5% of the jurisdiction); M – Medium Risk; moderate damage potential (damage to 5-10% of jurisdiction, infrequent occurrence); and H – High Risk; significant risk/major damage potential (damage to over 10% of jurisdiction, regular occurrence)

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TABLE 5-2: TOWN OF BOLIGEE HAZARD EVENTS

5 Thunderstorms Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
BOLIGEE	GREENE CO.	AL	04/10/2004	16:15	CST	Thunderstorm Wind	75 kts. EG	0	0	200.00K	1.600M
BOLIGEE	GREENE CO.	AL	03/07/2005	17:45	CST	Thunderstorm Wind	50 kts. ES	0	0	12.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	05/20/2005	17:19	CST	Thunderstorm Wind	54 kts. EG	0	0	11.00K	0.00K
GREENE CO.	GREENE CO.	AL	06/28/2011	12:16	CST-6	Thunderstorm Wind	40 kts. EG	0	0	0.50K	0.00K
WEST GREENE	GREENE CO.	AL	12/25/2012	17:00	CST-6	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
Totals:								0	0	223.50K	1.600M

0 Lightning Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

No lightning events occurred or were reported during 01/01/2003 thru 12/31/2013.

4 Hail Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
BOLIGEE	GREENE CO.	AL	04/10/2004	16:15	CST	Hail	2.50 in.	0	0	30.00K	0.00K
BOLIGEE	GREENE CO.	AL	03/13/2005	20:05	CST	Hail	0.88 in.	0	0	0.00K	0.00K
BOLIGEE	GREENE CO.	AL	03/31/2005	02:29	CST	Hail	0.75 in.	0	0	0.00K	0.00K
BOLIGEE	GREENE CO.	AL	02/13/2007	16:23	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
Totals:								0	0	30.00K	0.00K

0 Tornado Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

No tornado events occurred or were reported during 01/01/2003 thru 12/31/2013.

9 Flood/Flash Flood Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
GREENE (ZONE)	GREENE (ZONE)	AL	04/01/2005	00:00	CST	Flood		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/06/2005	00:00	CST	Flood		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	06/12/2005	06:45	CST	Flood		0	0	20.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	07/11/2005	00:00	CST	Flood		0	0	3.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	01/07/1998	00:00	CST	Flash Flood		0	0		
GREENE (ZONE)	GREENE (ZONE)	AL	04/07/2003	00:00	CST	Flash Flood		0	0		
GREENE (ZONE)	GREENE (ZONE)	AL	02/05/2004	00:00	CST	Flash Flood		0	0		
GREENE (ZONE)	GREENE (ZONE)	AL	02/06/2004	00:00	CST	Flash Flood		0	0		
GREENE (ZONE)	GREENE (ZONE)	AL	07/10/2005	00:00	CST	Flash Flood		0	0		
Totals:								0	0	23.00K	0.00K

15 Drought/Extreme Heat Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
GREENE (ZONE)	GREENE (ZONE)	AL	07/18/2006	07:00	CST	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/01/2006	00:00	CST	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/01/2006	00:00	CST	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	03/27/2007	06:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	05/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	06/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	07/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	10/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	11/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	12/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	01/01/2008	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	02/01/2008	00:00	CST-6	Drought		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

7 Winter Storm/Frost Freeze/Heavy Snow/Ice Storm/Winter Weather/Extreme Cold

Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
GREENE (ZONE)	GREENE (ZONE)	AL	01/09/2011	11:15	CST-6	Ice Storm		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	01/19/2008	06:00	CST-6	Winter Weather		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	02/12/2010	11:00	CST-6	Winter Weather		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	02/09/2011	17:15	CST-6	Winter Weather		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	01/24/2003	00:00	CST	Extreme Cold/wind Chill		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/07/2007	00:00	CST-6	Frost/freeze		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/08/2007	00:00	CST-6	Frost/freeze		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

8 Hurricane/Tropical Storm/Tropical Depression/High Wind/Strong Wind Events –

01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
GREENE (ZONE)	GREENE (ZONE)	AL	07/10/2005	15:00	CST	Tropical Storm		0	0	165.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/29/2005	17:00	CST	Tropical Storm		0	0	1.800M	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/23/2008	12:00	CST-6	Tropical Depression		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	11/09/2009	14:00	CST-6	Tropical Depression		0	0	1.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/16/2004	06:00	CST	High Wind	77 kts. EG	0	0	5.000M	75.00K
GREENE (ZONE)	GREENE (ZONE)	AL	06/11/2005	14:00	CST	Strong Wind	40 kts. EG	0	0	5.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	03/28/2009	05:30	CST-6	Strong Wind	35 kts. EG	0	0	5.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/05/2011	15:10	CST-6	Strong Wind	39 kts. EG	0	0	8.00K	0.00K
Totals:								0	0	6.984M	75.00K

0 Sinkhole Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database/U.S. Geological Survey)

No sinkhole events occurred or were reported during 01/01/2003 thru 12/31/2013.

0 Landslide Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database/U.S. Geological Survey)

No landslide events occurred or were reported during 01/01/2003 thru 12/31/2013.

1 Earthquake Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database/U.S. Geological Survey)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
MT. HEBRON/BOLIGEE	GREENE COUNTY	AL	05/16/2006		CST	Earthquake	2.5 Mag	0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

No earthquake events occurred or were reported during 01/01/2003 thru 12/31/2013.

54 Wildfire Events – 1/1/2010 thru 12/31/2013

(Source: Alabama Forestry Commission)

County	Total # of Fires 2010-2013	Average # of Fires Per Year	Total Acres Burned 2010-2013	Average Acres Burned Per Year	Average Fire Size in Acres
Greene	54	18	604.40	201	11

0 Dam/Levee Failure Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database/Local Input)

No dam/levee failure events occurred or were reported during 01/01/2003 thru 12/31/2013.

**Table 5-3: Town of Boligee
Hazard Probability Assessment**

Natural Hazards	Number of Historical Occurrences	Probability of Future Occurrence	Extent	Area Affected
Thunderstorm	5	50%	>10%	Town wide
Lightning	0	Unknown	5-10%	Town wide
Hail	4	40%	>10%	Town wide
Tornado	0	Unknown	5-10%	Town wide
Flood/Flash Flood	9	90%	5-10%	Town wide
Drought/Extreme Heat	15	>100%	5-10%	Town wide
Winter Storm/Frost Freeze/Heavy Snow/Ice Storm/Winter Weather/Extreme Cold	7	70%	<5%	Town wide
Hurricane/Tropical Storm/Tropical Depression/High Wind/Strong Wind	8	80%	<5%	Town wide
Sinkhole/Expansive Soil	0	Unknown	<5%	Town wide
Landslide	0	Unknown	N/A	N/A
Earthquake	1	10%	5-10%	Town wide
Wildfire (2010-2013 – 3 year study period)	54	>100%	<5%	Town wide
Dam/Levee Failure	0	Unknown	<5%	Town wide

Source: NOAA NCDC; U. S. Inflation Calculator/Consumer Price Index; USGS ; Local Input; USDA Census of Agriculture; Alabama Forestry Commission; and National Forestry Service; Participating Jurisdictions

Methodology: Number of historical occurrences is those reported by NOAA NCDC during the 10 year study period, with the exception of wildfire that is a 3 year study period. Probability is expressed by dividing the total number of occurrences by the study period in years. Extent is expressed as the percentage assigned by the jurisdictions' ranking in the vulnerability summary (Table 4-12). Zero denotes no data available to determine the probability, extent, or affected area.

TABLE 5-4: Town of Boligee Critical Facilities

Facility	Location	Use	Value
Governmental Services			
Boligee Town Hall & VFD	Constantine & Hwy 11	Local government	\$1,000,000
Public Works			
Water Tank OUT OF SERVICE	CR 76	Water System	\$500,000
Sewer Pump Station 1	CR20	Sewer System	\$55,000
Sewer Pump Station 2	CR20/CR81	Sewer System	\$55,000
Sewer Pump Station 3	Bell Merrit Rd	Sewer System	\$55,000
Sewer Pump Station 4	CR81/CR82	Sewer System	\$55,000
Sewer Pump Station 5	CR20/I20-59	Sewer System	\$55,000
Education			
Paramount School	CR 20 & I-20	Education	\$4,868,450
Industrial			
REM Services	Allison St.	Medical	\$15,000,000
Miscellaneous			
Phone Station	Hwy76	Communications	\$1,000,000
Phone Station	Hwy 11	Communications	\$1,000,000
Outdoor Warning Siren (#2)	Constantine/US Hwy 11	Weather Warning	\$20,000
Source: Local Jurisdictions			TOTAL \$23,663,450

**Table 5-5: Town of Boligee
Estimated Loss Projections from Specified Hazards**

Natural Hazards	Average Occurrences (per year)	Total Deaths	Total Injuries	Average Death and Injury Loss (per event)	Average Crop and Property Loss (per event)	Projected Loss (per event)
Thunderstorm	.5	0	0	\$0	\$364,700	\$397,523
Lightning	0	0	0	\$0	\$0	Unknown
Hail	.4	0	0	\$0	\$7,500	\$8,175
Tornado	0	0	0	\$0	\$0	Unknown
Flood/Flash Flood	.9	0	0	\$0	\$2,556	\$2,786
Drought/Extreme Heat	1.5	0	0	\$0	\$0	Unknown
Winter Storm/Frost Freeze/Heavy Snow/Ice Storm/Winter Weather/Extreme Cold	.7	0	0	\$0	\$0	Unknown
Hurricane/Tropical Storm/Tropical Depression/High Wind/Strong Wind	.8	0	0	\$0	\$882,375	\$961,789
Sinkhole/Expansive Soils	0	0	0	\$0	\$0	Unknown
Landslide	0	0	0	\$0	\$0	Unknown
Earthquake	.1	0	0	\$0	\$0	Unknown
Wildfire (3 year study period)	18.0	0	0	\$0	\$1,128,600	\$1,230,174
Dam/Levee Failure	0	0	0	\$0	\$0	Unknown

Sources: NOAA NCDC; U.S. Inflation Calculator/Consumer Price Index; Local Input; USDA Census of Agriculture; Alabama Forestry Commission and National Forestry Service; Alabama Geological Survey

Methodology: Average occurrences were expressed annually by dividing the total number of occurrences by the ten-year period. Deaths and injuries were taken from the hazard event data. Average losses were calculated by dividing the total amount of all damages by the total number of occurrences during the ten-year period with the exception of wildfire which is a 3-year period (average # fires per year x average fire size in acres x \$1,900/acre average). Projected loss expresses an estimated damage amount per future occurrence by converting the average loss figure from a midpoint of 2008 dollars to 2014 dollars (\$1 in 2008 = \$1.09 in 2014...a cumulative rate of inflation of 9%). Zero denotes no data available to determine the average occurrences, average loss or projected loss per event.

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Town of Boligee Mitigation Action Plan

The Town of Boligee recognizes the importance of Mitigation Planning and will incorporate mitigation planning in planning documents as they are revised or initiated.

Mitigation Status

During the plan update, mitigation actions were reviewed in order to identify completed, deferred, or deleted actions from the previous plan and incorporate actions added during annual updates. **Table 5-6** shows the Town of Boligee's updated mitigation actions. During the plan update process no new actions were identified. In the 2009 plan revision, priorities were expressed by numbering 1 as the highest priority – the higher the number, the lower the priority. For this plan revision, the committee decided to assign a new prioritization labeling as one project may be equally as important as another project. As a result, projects will be labeled high, medium, and low in priority.

BENCHMARKING:

Town of Boligee Mitigation Action Plan (2009)

1. Install outdoor warning sirens in town – *Action revised and is ongoing*
 - During the past five years, one outdoor warning siren has been installed.
Installation of another outdoor warning siren is in process.
2. Upgrade communications equipment – *Action deleted as it parallels with Action #6 below.*
3. Construct fire station with short-term shelter – *Action revised and is ongoing*
 - During the past five years, eight short-term individual shelters have been installed countywide. Installations of ten additional short-term individual shelters are in process countywide.
4. Install security measures to critical facilities – *Action is ongoing*
5. Join NFIP – *Action completed, revised, and is ongoing*
6. Improved communications equipment for First Responders – *Action revised and is ongoing*

During the plan update process, one action is ongoing, three actions were revised and are

ongoing, one action was completed/revised/ongoing, and one action was deleted from the plan.

Mitigation Strategy – Town of Boligee

Goal 1: Protect life

Objective 1.1 Improve Warning and Emergency Communication Systems

Action 1.1.1 Install additional outdoor warning sirens throughout town

Objective 1.2 Reduce impacts of hazards on vulnerable populations

Action 1.2.1 Install/construct short-term individual storm shelters

Objective 1.3 Improve disaster response and recovery

Goal 2: Protect property

Objective 2.1 Reduce losses to critical facilities/assets

Action 2.1.1 Install security measures to critical facilities

Objective 2.2 Participate in the NFIP

Action 2.2.1 Continue participation in the NFIP

Objective 2.3 Provide and maintain essential public services

Action 2.3.1 Purchase and implement communications system for first responders

Objective 2.4 Reduce losses due to drainage problems

Goal 3: Reduce economic impacts of disasters

Objective 3.1 Maintain operations of critical businesses and major employers

Goal 4: Protect environment and natural resources

Objective 4.1 Identify, protect, and properly manage flood plains

Objective 4.2 Enforce local codes and regulations related to NFIP

Goal 5: Increase public preparedness for disasters

Objective 5.1 Continue to train severe weather spotters

Table 5-6: Town of Boligee Mitigation Actions

Mitigation Action 1.1.1	Install additional outdoor warning sirens throughout town
Hazard(s) Addressed	All
Applies to new/existing asset	New
Local Planning Mechanism	Greene County EMA, Town of Boligee
Time frame for Completion	Two years from funding availability
Estimated Cost	\$30,000 each
Funding Sources	Grants, Local
Priority	High

Mitigation Action 1.2.1	Install/construct short-term individual storm shelters
Hazard(s) Addressed	All
Applies to new/existing asset	New
Local Planning Mechanism	Greene County EMA, Town of Boligee
Time frame for Completion	Two years from funding availability
Estimated Cost	\$6,000 each
Funding Sources	Grants, Local
Priority	High

Mitigation Action 2.1.1	Install security measures to critical facilities
Hazard(s) Addressed	All
Applies to new/existing asset	Existing
Local Planning Mechanism	Greene County EMA, Greene County Board of Education
Time frame for Completion	One year from funding availability
Estimated Cost	\$25,000
Funding Sources	Grants, Local
Priority	Medium

Mitigation Action 2.2.1	Continue participation in the NFIP
Hazard(s) Addressed	Flood
Applies to new/existing asset	New and Existing
Local Planning Mechanism	Greene County EMA/Commission
Time frame for Completion	Continuous
Estimated Cost	\$0
Funding Sources	Local
Priority	Low

Mitigation Action 2.3.1	Purchase and implement communications system for first responders
Hazard(s) Addressed	All
Applies to new/existing asset	Existing
Local Planning Mechanism	Greene County EMA, Greene County Board of Education
Time frame for Completion	One year from funding availability
Estimated Cost	\$200,000
Funding Sources	Grants, Local
Priority	Medium

City of Eutaw

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**Table 5-7: City of Eutaw
Risk and Vulnerability Overview**

Natural Hazards	Hazard Identification	Prioritized Occurrence Threat	Vulnerability
Thunderstorm	X	3	H
Lightning	X	8	M
Hail	X	6	M
Tornado	X	7	H
Flood/Flash Flood	X	4	M
Drought/Extreme Heat	X	2	H
Winter Storm/Frost Freeze/Heavy Snow/Ice Storm/Winter/Weather/Extreme Cold	X	5	M
Hurricane/Tropical Storm/Tropical Depression/High Wind/Strong Wind	X	4	H
Sinkhole/Expansive Soil	X	8	L
Landslide	N/A	N/A	N/A
Earthquake	X	8	L
Wildfire	X	1	M
Dam/Levee Failure	X	8	L

KEY:
Hazard Identification – Identified by local jurisdictions
Prioritized Occurrence Threat - Hazards are prioritized with the highest threat of occurrence assigned number one based on hazardous events that have occurred within each jurisdiction over the past ten years, with the exception of wildfires that were based on events that have occurred over the past 3 years. Some natural hazards have equal threats to a jurisdiction; therefore, their threat number will be the same.
Vulnerability – Identified by local jurisdictions. NA – Not Applicable; not a hazard to the jurisdiction; L – Low Risk; little damage potential (damage to less than 5% of the jurisdiction); M – Medium Risk; moderate damage potential (damage to 5-10% of jurisdiction, infrequent occurrence); and H – High Risk; significant risk/major damage potential (damage to over 10% of jurisdiction, regular occurrence)

(Source: NOAA NCDC Storm Events Database; Alabama Forestry Commission; National Forestry Service; Alabama Geological Survey; Participating Jurisdictions)

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TABLE 5-8: CITY OF EUTAW HAZARD EVENTS

13 Thunderstorms Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
EUTAW	GREENE CO.	AL	12/07/2004	05:15	CST	Thunderstorm Wind	52 kts. EG	0	0	1.00K	0.00K
EUTAW	GREENE CO.	AL	04/06/2005	13:12	CST	Thunderstorm Wind	40 kts. EG	0	0	3.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	05/20/2005	17:19	CST	Thunderstorm Wind	54 kts. EG	0	0	11.00K	0.00K
EUTAW	GREENE CO.	AL	03/09/2006	17:04	CST	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
EUTAW	GREENE CO.	AL	06/29/2008	13:59	CST-6	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
EUTAW	GREENE CO.	AL	07/04/2008	17:17	CST-6	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
EUTAW	GREENE CO.	AL	06/12/2009	19:37	CST-6	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
EUTAW	GREENE CO.	AL	12/08/2009	23:50	CST-6	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
EUTAW	GREENE CO.	AL	08/15/2010	20:15	CST-6	Thunderstorm Wind	60 kts. EG	0	0	6.00K	0.00K
EUTAW	GREENE CO.	AL	09/03/2012	20:10	CST-6	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
EUTAW	GREENE CO.	AL	03/23/2013	21:04	CST-6	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
EUTAW	GREENE CO.	AL	06/28/2013	10:12	CST-6	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
EUTAW	GREENE CO.	AL	06/28/2013	18:04	CST-6	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
Totals:								0	0	33.00K	0.00K

0 Lightning Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

No lightning events occurred or were reported during 01/01/2003 thru 12/31/2013.

5 Hail Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
EUTAW	GREENE CO.	AL	04/25/2003	12:20	CST	Hail	0.75 in.	0	0	0.00K	0.00K
EUTAW	GREENE CO.	AL	05/02/2003	15:20	CST	Hail	1.75 in.	0	0	70.00K	0.00K
EUTAW	GREENE CO.	AL	03/13/2005	20:04	CST	Hail	0.88 in.	0	0	0.00K	0.00K
EUTAW	GREENE CO.	AL	03/22/2005	08:39	CST	Hail	0.75 in.	0	0	0.00K	0.00K
EUTAW	GREENE CO.	AL	04/06/2005	13:12	CST	Hail	0.75 in.	0	0	1.00K	0.00K
Totals:								0	0	71.00K	0.00K

1 Tornado Event – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
EUTAW	GREENE CO.	AL	03/04/2008	00:49	CST-6	Tornado	EF1	0	0	150.00K	0.00K
Totals:								0	0	150.00K	0.00K

8 Flood/Flash Flood Events – 01/01/2003 thru 12/31/2013 (4018 days)
(Source: NOAA NCDC Storm Events Database)

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
GREENE (ZONE)	GREENE (ZONE)	AL	04/01/2005	00:00	CST	Flood		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/06/2005	00:00	CST	Flood		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	06/12/2005	06:45	CST	Flood		0	0	20.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	07/11/2005	00:00	CST	Flood		0	0	3.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	04/07/2003	05:00	CST	Flash Flood		0	0	10.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	02/05/2004	21:30	CST	Flash Flood		0	0	0.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	02/06/2004	00:10	CST	Flash Flood		0	0	5.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	07/10/2005	18:00	CST	Flash Flood		0	0	15.00K	0.00K
Totals:								0	0	53.00K	0.00K

15 Drought/Extreme Heat Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Ini	PrD	CrD
GREENE (ZONE)	GREENE (ZONE)	AL	07/18/2006	07:00	CST	Drought	D-2	0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/01/2006	00:00	CST	Drought	D-3	0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/01/2006	00:00	CST	Drought	D-3	0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	03/27/2007	06:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	05/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	06/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	07/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	10/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	11/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	12/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	01/01/2008	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	02/01/2008	00:00	CST-6	Drought		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

7 Winter Storm/Frost Freeze/Heavy Snow/Ice Storm/Winter Weather/Extreme Cold

Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
GREENE (ZONE)	GREENE (ZONE)	AL	01/09/2011	11:15	CST-6	Ice Storm		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	01/19/2008	06:00	CST-6	Winter Weather		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	02/12/2010	11:00	CST-6	Winter Weather		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	02/09/2011	17:15	CST-6	Winter Weather		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	01/24/2003	00:00	CST	Extreme Cold/wind Chill		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/07/2007	00:00	CST-6	Frost/freeze		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/08/2007	00:00	CST-6	Frost/freeze		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

8 Hurricane/Tropical Storm/Tropical Depression/High Wind/Strong Wind Events –

01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
GREENE (ZONE)	GREENE (ZONE)	AL	07/10/2005	15:00	CST	Tropical Storm		0	0	165.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/29/2005	17:00	CST	Tropical Storm		0	0	1.800M	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/23/2008	12:00	CST-6	Tropical Depression		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	11/09/2009	14:00	CST-6	Tropical Depression		0	0	1.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/16/2004	06:00	CST	High Wind	77 kts. EG	0	0	5.000M	75.00K
GREENE (ZONE)	GREENE (ZONE)	AL	06/11/2005	14:00	CST	Strong Wind	40 kts. EG	0	0	5.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	03/28/2009	05:30	CST-6	Strong Wind	35 kts. EG	0	0	5.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/05/2011	15:10	CST-6	Strong Wind	39 kts. EG	0	0	8.00K	0.00K
Totals:								0	0	6.984M	75.00K

0 Sinkhole Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database/U.S. Geological Survey)

No sinkhole events occurred or were reported during 01/01/2003 thru 12/31/2013.

0 Landslide Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database/U.S. Geological Survey)

No landslide events occurred or were reported during 01/01/2003 thru 12/31/2013.

0 Earthquake Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database/U.S. Geological Survey)

No earthquake events occurred or were reported during 01/01/2003 thru 12/31/2013.

54 Wildfire Events – 1/1/2010 thru 12/31/2013

(Source: Alabama Forestry Commission)

County	Total # of Fires 2010- 2013	Average # of Fires Per Year	Total Acres Burned 2010- 2013	Average Acres Burned Per Year	Average Fire Size in Acres
Greene	54	18	604.40	201	11

0 Dam/Levee Failure Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database/Local Input)

No dam/levee failure events occurred or were reported during 01/01/2003 thru 12/31/2013.

**Table 5-9: City of Eutaw
Hazard Probability Assessment**

Natural Hazards	Number of Historical Occurrences	Probability of Future Occurrence	Extent	Area Affected
Thunderstorm	13	>100%	>10%	Citywide
Lightning	0	Unknown	5-10%	Citywide
Hail	5	50%	5-10%	Citywide
Tornado	1	10%	>10%	Citywide
Flood/Flash Flood	8	80%	5-10%	Citywide
Drought/Extreme Heat	15	>100%	>10%	Citywide
Winter Storm/Frost Freeze/Heavy Snow/Ice Storm/Winter Weather/Extreme Cold	7	70%	5-10%	Citywide
Hurricane/Tropical Storm/Tropical Depression/High Wind/Strong Wind	8	80%	>10%	Citywide
Sinkhole/Expansive Soil	0	Unknown	<5%	Citywide
Landslide	0	N/A	N/A	N/A
Earthquake	0	Unknown	<5%	Citywide
Wildfire (2010-2013 – 3 year study period)	54	>100%	5-10%	Citywide
Dam/Levee Failure	0	Unknown	<5%	Citywide

Source: NOAA NCDC; U. S. Inflation Calculator/Consumer Price Index; USGS ; Local Input; USDA Census of Agriculture; Alabama Forestry Commission; and National Forestry Service; Participating Jurisdictions

Methodology: Number of historical occurrences is those reported by NOAA NCDC during the 10 year study period, with the exception of wildfire that is a 3 year study period. Probability is expressed by dividing the total number of occurrences by the study period in years. Extent is expressed as the percentage assigned by the jurisdictions' ranking in the vulnerability summary (Table 4-12). Zero denotes no data available to determine the probability, extent, or affected area.

TABLE 5-10: City of Eutaw Critical Facilities

Facility	Location	Use	Value
Governmental Services			
Eutaw City Hal	116 Main St	Government/ VFD	\$3,000,000
Eutaw Post Office	256 Prairie Ave	Mail/ Future EMA Office	3,000,000
Greene County Courthouse	400 Morrow Ave	County Government	10,000,000
Greene County EMA	1005 Barn St	Present EMA Office	250,000
Greene County DHR	Hwy 43 (Bull Run)	Public Assistance	4,000,000
Greene County E-911	226 Main St	Emergency Services	500,000
Greene County Jai	Finches Ferry	Jail	15,000,000
Eutaw PD		Police Deptartment	1,260,000
Public Works			
Eutaw Public Works Facility	Bull Run Rd	Utilities	\$80,000
Booster Pump Station	Clark Lagoon- Hwy 11	Potable Water	30,000
Water Tank (1 of 4)	Landfill	Potable Water	450,000
Water Tank (2 of 4)	City Hall	Potable Water	450,000
Water Tank (3 of 4)	National Guard Armory	Potable Water	500,000
Well #2	Hwy 11	Potable Water	375,000
Well #3	Behind City Hall	Potable Water	250,000
Sewer Treatment Plan	Bull Run Rd	Sewer Treatment	15,000,000
Education			
Carver Elementary School	527 Greensboro St	Education	\$4,491,530
Eutaw Elementary School	200 Eutaw Ave S	Education	3,812,560
Greene County High School	623 Mesopotamia St	Education	5,973,740
Warrior Academy	Lansford St	Education	1,231,430
Peter Kirksey AVC	Lower Gainesville Rd	Education	6,733,560
Green County Board of Education	220 Main Street	Education	1,000,000
Industrial			
National Plantation Pipe	Finches Ferry Rd	Gas Distribution	\$500,000
Miscellaneous			
Alabama Power	Prairie Ave	Electrical Power	\$1,000,000
Bell South Central Office	Eutaw Ave	Communications	5,000,000
Greene County Public Health	400 Morrow Ave	Health Services	2,000,000
Greene County Hospital	509 Wilson Ave	Health Care	14,484,210
Greene County Nursing Home	509 Wilson Ave	Health Care	10,000,000
DaVita Dialysis Clinic	Hwy 43	Dialysis	2,000,000
Eutaw Bait Shop/Chevron	1st Avenue	Fuel	1,000,000
Edgar's Supermarket	Greensboro St.	Grocery Supplies	1,000,000
National Guard Armory	809 Mesopotamia St	Civic Center/Shelter	50,000,000
Outdoor Warning Siren (#1)	116 Main St	Weather Warning	30,000
Source: Local Jurisdictions			TOTAL \$164,402,030

**Table 5-11: City of Eutaw
Estimated Loss Projections from Specified Hazards**

Natural Hazards	Average Occurrences (Per year)	Total Deaths	Total Injuries	Average Death and Injury Loss (Per event)	Average Crop and Property Loss (Per event)	Projected Loss (Per event)
Thunderstorm	1.3	0	0	\$0	\$3,222	\$3,512
Lightning	0	0	0	\$0	\$0	Unknown
Hail	.5	0	0	\$0	\$14,200	\$15,478
Tornado	.1	0	0	\$0	\$150,000	\$163,500
Flood/Flash Flood	.8	0	0	\$0	\$6,625	\$7,221
Drought/Extreme Heat	1.5	0	0	\$0	\$0	Unknown
Winter Storm/Frost Freeze/ Heavy Snow/Ice Storm/ Winter Weather/Extreme Cold	.7	0	0	\$0	\$0	Unknown
Hurricane/Tropical Storm/ Tropical Depression/High Wind/Strong Wind	.8	0	0	\$0	\$882,375	\$961,789
Sinkhole/Expansive Soil	0	0	0	\$0	\$0	Unknown
Landslide	0	0	0	\$0	\$0	Unknown
Earthquake	0	0	0	\$0	\$0	Unknown
Wildfire (2010-2013 – 3 year study period)	18.0	0	0	\$0	\$376,200	\$410,058
Dam/Levee Failure	0	0	0	\$0	\$0	Unknown

Sources: NOAA NCDC; U.S. Inflation Calculator/Consumer Price Index; Local Input; USDA Census of Agriculture; Alabama Forestry Commission and National Forestry Service; Alabama Geological Survey

Methodology: Average occurrences were expressed annually by dividing the total number of occurrences by the ten-year period. Deaths and injuries were taken from the hazard event data. Average losses were calculated by dividing the total amount of all damages by the total number of occurrences during the ten-year period with the exception of wildfire which is a 3-year period (average # fires per year x average fire size in acres x \$1,900/acre average). Projected loss expresses an estimated damage amount per future occurrence by converting the average loss figure from a midpoint of 2008 dollars to 2014 dollars (\$1 in 2008 = \$1.09 in 2014...a cumulative rate of inflation of 9%). Zero denotes no data available to determine the average occurrences, average loss or projected loss per event.

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City of Eutaw Mitigation Action Plan

The City of Eutaw recognizes the importance of Mitigation Planning and will incorporate mitigation planning in planning documents as they are revised or initiated.

Mitigation Status

During the plan update, mitigation actions were reviewed in order to identify completed, deferred, or deleted actions from the previous plan and incorporate actions added during annual updates. **Table 5-6** shows the City of Eutaw's updated mitigation actions. During the plan update process no new actions were identified. In the 2009 plan revision, priorities were expressed by numbering 1 as the highest priority – the higher the number, the lower the priority. For this plan revision, the committee decided to assign a new prioritization labeling as one project may be equally as important as another project. As a result, projects will be labeled high, medium, and low in priority.

BENCHMARKING:

City of Eutaw Mitigation Action Plan (2009)

1. Install additional outdoor warning sirens in city – *Action ongoing*
2. Construct long-term storm shelter with water, kitchen, generator – *Action revised and ongoing*
3. Install transfer switch, connect existing generators – *Action ongoing*
4. Install security measures to critical facilities – *Action ongoing*
5. Enforce floodplain management requirements; regulate construction or improvements in Special Flood Hazard Areas (SFHAs) – *Action ongoing*
6. Provide emergency generators at critical facilities – *Action ongoing*
7. Upgrade drainage systems throughout city – *Action ongoing*

During the 2015 plan update, one action was revised and is ongoing; all other actions are ongoing.

Mitigation Strategy – City of Eutaw

Goal 1: Protect life

Objective 1.1 Improve Warning and Emergency Communication Systems

Action 1.1.1 Install additional outdoor warning sirens throughout city

Objective 1.2 Reduce impacts of hazards on vulnerable populations

Action 1.2.1 Install/construct long-term community safe rooms to include generators and outdoor warning sirens, if needed

Objective 1.3 Improve disaster response and recovery

Goal 2: Protect property

Objective 2.1 Reduce losses to critical facilities/assets

Action 2.1.1 Install transfer switch, connect existing generators

Action 2.1.2 Install security measures to critical facilities

Objective 2.2 Continue Participation in NFIP program

Action 2.2.1 Enforce floodplain management requirements; regulate construction or improvements in Special Flood Hazard Areas (SFHAs).

Objective 2.3 Provide and maintain essential public services

Action 2.3.1 Provide emergency generators at critical facilities

Objective 2.4 Reduce losses due to drainage problems

Action 2.4.1 Improve drainage systems throughout city

Goal 3: Reduce economic impacts of disasters

Objective 3.1 Maintain operations of critical businesses and major employers

Goal 4: Protect environment and natural resources

Objective 4.1 Identify, protect, and properly manage flood plains

Objective 4.2 Enforce local codes and regulations related to NFIP

Goal 5: Increase public preparedness for disasters

Objective 5.1 Continue to train severe weather spotters

Table 5-12: City of Eutaw Mitigation Actions

Mitigation Action 2.1.1	Install transfer switch and connect existing generators at City Hall and National Guard building
Hazard(s) Addressed	All
Applies to new/existing asset	Existing
Local Planning Mechanism	City of Eutaw
Time frame for Completion	6 months from funding availability
Estimated Cost	\$25,000 each
Funding Sources	Grants, local
Priority	High
Mitigation Action 1.1.1	Install additional outdoor warning sirens throughout city
Hazard(s) Addressed	All
Applies to new/existing asset	New
Local Planning Mechanism	Greene County EMA, City of Eutaw
Time frame for Completion	One year from funding availability
Estimated Cost	\$30,000 each
Funding Sources	Grants, local
Priority	High
Mitigation Action 2.3.1	Provide emergency generators at critical facilities
Hazard(s) Addressed	All
Applies to new/existing asset	New
Local Planning Mechanism	City of Eutaw
Time frame for Completion	One year from funding availability
Estimated Cost	\$35,000 each
Funding Sources	Grants, local
Priority	Medium
Mitigation Action 2.2.1	Enforce floodplain management requirements, regulate construction or improvements in Special Flood Hazard Areas (SFHA's)
Hazard(s) Addressed	Flood
Applies to new/existing asset	New and Existing
Local Planning Mechanism	City of Eutaw
Timeframe for Completion	Continuous
Estimated Cost	
Funding Sources	Local
Priority	Low
Mitigation Action 2.4.1	Upgrade drainage systems throughout City
Hazard(s) Addressed	All
Applies to new/existing asset	New and Existing
Local Planning Mechanism	City of Eutaw
Timeframe for Completion	One year from funding availability
Estimated Cost	\$2,000,000
Funding Sources	Grants, local
Priority	Low

Mitigation Action 1.2.1	Install/construct long-term community safe rooms to include generators and outdoor warning sirens, if needed
Hazard(s) Addressed	All
Applies to new/existing asset	New
Local Planning Mechanism	Greene County EMA, City of Eutaw
Timeframe for Completion	Two years from funding availability
Estimated Cost	\$130,000 each
Funding Sources	Grants, local
Priority	Medium
Mitigation Action 2.1.2	Install security measures at critical facilities
Hazard(s) Addressed	Chemical agent, Conventional Bomb/Explosive
Applies to new/existing asset	Existing
Local Planning Mechanism	City of Eutaw
Timeframe for Completion	One year from funding availability
Estimated Cost	\$70,000
Funding Sources	Grants, Local
Priority	Low

Town of Forkland

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**Table 5-13: Town of Forkland
Risk and Vulnerability Overview**

Natural Hazards	Hazard Identification	Prioritized Occurrence Threat	Vulnerability
Thunderstorm	X	5	H
Lightning	X	8	M
Hail	X	5	M
Tornado	X	6	H
Flood/Flash Flood	X	3	M
Drought/Extreme Heat	X	2	M
Winter Storm/Frost Freeze/ Heavy Snow/Ice Storm/Winter Weather/Extreme Cold	X	4	M
Hurricane/Tropical Storm/ Tropical Depression/High Wind/Strong Wind	X	3	M
Sinkhole/Expansive Soil	X	8	L
Landslide	N/A	N/A	N/A
Earthquake	X	7	M
Wildfire	X	1	M
Dam/Levee Failure	X	8	L
Man-made Hazards			
Hazardous Material Release	X	3	H
Arson/Incendiary Attack	X	2	M
Armed Attack	X	1	L
Conventional Bomb	X	4	L
Chemical Agent	X	5	L
Cyberterrorism	X	8	L
Agriterrorism	X	7	L
Biological Agent	X	6	M
Radiological Agent	X	9	M
Nuclear Bomb	X	10	L
<i>Sources: NOAA NCDC Storm Events Database; Alabama Forestry Commission; National Forestry Service; Alabama Geological Survey; Participating Jurisdictions</i>			
<p>KEY: Hazard Identification – Identified by local jurisdictions Prioritized Occurrence Threat - Hazards are prioritized with the highest threat of occurrence assigned number one based on hazardous events that have occurred within each jurisdiction over the past ten years, with the exception of wildfires that were based on events that have occurred over the past three years. Some natural hazards have equal threats to a jurisdiction; therefore, their threat number will be the same. Vulnerability – Identified by local jurisdictions. NA – Not Applicable; not a hazard to the jurisdiction; L – Low Risk; little damage potential (damage to less than 5% of the jurisdiction); M – Medium Risk; moderate damage potential (damage to 5-10% of jurisdiction, infrequent occurrence); and H – High Risk; significant risk/major damage potential (damage to over 10% of jurisdiction, regular occurrence)</p>			

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TABLE 5-14: TOWN OF FORKLAND HAZARD EVENTS**5 Thunderstorms Events – 01/01/2003 thru 12/31/2013 (4018 days)***(Source: NOAA NCDC Storm Events Database)*

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
COUNTYWIDE	GREENE CO.	AL	05/20/2005	17:19	CST	Thunderstorm Wind	54 kts. EG	0	0	11.00K	0.00K
FORKLAND	GREENE CO.	AL	04/04/2008	13:50	CST-6	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
FORKLAND	GREENE CO.	AL	02/18/2009	16:08	CST-6	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
FORKLAND	GREENE CO.	AL	05/03/2009	12:20	CST-6	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
GREENE CO.	GREENE CO.	AL	06/28/2011	12:16	CST-6	Thunderstorm Wind	40 kts. EG	0	0	0.50K	0.00K
Totals:								0	0	24.50K	0.00M

0 Lightning Events – 01/01/2003 thru 12/31/2013 (4018 days)*(Source: NOAA NCDC Storm Events Database)*

No lightning events occurred or were reported during 01/01/2003 thru 12/31/2013.

5 Hail Events – 01/01/2003 thru 12/31/2013 (4018 days)*(Source: NOAA NCDC Storm Events Database)*

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
FORKLAND	GREENE CO.	AL	04/06/2003	15:29	CST	Hail	1.00 in.	0	0	0.00K	0.00K
FORKLAND	GREENE CO.	AL	04/22/2005	12:12	CST	Hail	0.75 in.	0	0	1.00K	0.00K
FORKLAND	GREENE CO.	AL	04/22/2005	17:22	CST	Hail	1.00 in.	0	0	1.00K	0.00K
FORKLAND	GREENE CO.	AL	03/23/2013	18:16	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
FORKLAND	GREENE CO.	AL	03/23/2013	18:18	CST-6	Hail	1.50 in.	0	0	0.00K	0.00K
TOTAL								0	0	2.00K	0.00K

3 Tornado Events – 01/01/2003 thru 12/31/2013 (4018 days)*(Source: NOAA NCDC Storm Events Database)*

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
FORKLAND	GREENE CO.	AL	04/25/2003	13:25	CST	Tornado	F0	0	0	100.00K	0.00K
FORKLAND	GREENE CO.	AL	04/24/2010	10:22	CST-6	Tornado	EF1	0	2	50.00K	0.00K
FORKLAND	GREENE CO.	AL	04/15/2011	15:44	CST-6	Tornado	EF1	0	0	371.00K	0.00K
TOTAL								0	2	521.00K	0.00K

8 Flood/Flash Flood Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
GREENE (ZONE)	GREENE (ZONE)	AL	04/01/2005	00:00	CST	Flood		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/06/2005	00:00	CST	Flood		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	06/12/2005	06:45	CST	Flood		0	0	20.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	07/11/2005	00:00	CST	Flood		0	0	3.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	04/07/2003	05:00	CST	Flash Flood		0	0	10.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	02/05/2004	21:30	CST	Flash Flood		0	0	0.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	02/06/2004	00:10	CST	Flash Flood		0	0	5.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	07/10/2005	18:00	CST	Flash Flood		0	0	15.00K	0.00K
Totals:								0	0	53.00K	0.00K

15 Drought/Extreme Heat Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
GREENE (ZONE)	GREENE (ZONE)	AL	07/18/2006	07:00	CST	Drought	D-2	0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/01/2006	00:00	CST	Drought	D-3	0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/01/2006	00:00	CST	Drought	D-3	0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	03/27/2007	06:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	05/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	06/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	07/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	10/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	11/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	12/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	01/01/2008	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	02/01/2008	00:00	CST-6	Drought		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

7 Winter Storm/Frost Freeze/Heavy Snow/Ice Storm/Winter Weather/Extreme Cold Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
GREENE (ZONE)	GREENE (ZONE)	AL	01/09/2011	11:15	CST-6	Ice Storm		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	01/19/2008	06:00	CST-6	Winter Weather		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	02/12/2010	11:00	CST-6	Winter Weather		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	02/09/2011	17:15	CST-6	Winter Weather		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	01/24/2003	00:00	CST	Extreme Cold/wind Chill		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/07/2007	00:00	CST-6	Frost/freeze		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/08/2007	00:00	CST-6	Frost/freeze		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

**8 Hurricane/Tropical Storm/Tropical Depression/High Wind/Strong Wind Events – 01/01/2003
thru 12/31/2013 (4018 days)**

(Source: NOAA NCDC Storm Events Database)

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
GREENE (ZONE)	GREENE (ZONE)	AL	07/10/2005	15:00	CST	Tropical Storm		0	0	165.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/29/2005	17:00	CST	Tropical Storm		0	0	1.800M	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/23/2008	12:00	CST-6	Tropical Depression		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	11/09/2009	14:00	CST-6	Tropical Depression		0	0	1.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/16/2004	06:00	CST	High Wind	77 kts. EG	0	0	5.000M	75.00K
GREENE (ZONE)	GREENE (ZONE)	AL	06/11/2005	14:00	CST	Strong Wind	40 kts. EG	0	0	5.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	03/28/2009	05:30	CST-6	Strong Wind	35 kts. EG	0	0	5.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/05/2011	15:10	CST-6	Strong Wind	39 kts. EG	0	0	8.00K	0.00K
Totals:								0	0	6.984M	75.00K

0 Sinkhole Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database/U.S. Geological Survey)

No sinkhole events occurred or were reported during 01/01/2003 thru 12/31/2013.

0 Landslide Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database/U.S. Geological Survey)

No landslide events occurred or were reported during 01/01/2003 thru 12/31/2013.

1 Earthquake Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: Homefacts.com; City-data.com; and U.S. Geological Survey)

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
FORKLAND /BRAGGVILLE	GREENE COUNTY	AL	11/07/2004	11:20 a	CST	Earthquake	4.3-4.4 Mag/5 km depth	0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

No earthquake events were reported to NOAA NCDC during 01/01/2003 thru 12/31/2013.

54 Wildfire Events – 1/1/2010 thru 12/31/2013

(Source: Alabama Forestry Commission)

County	Total # of Fires 2010-2013	Average # of Fires Per Year	Total Acres Burned 2010-2013	Average Acres Burned Per Year	Average Fire Size in Acres
Greene	54	18	604.40	201	11

0 Dam/Levee Failure Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database/Local Input)

No dam/levee failure events occurred or were reported during 01/01/2003 thru 12/31/2013.

**Table 5-15: Town of Forkland
Hazard Probability Assessment**

Natural Hazards	Number of Historical Occurrences	Probability of Future Occurrence	Extent	Area Affected
Thunderstorm	5	50%	>10%	Town wide
Lightning	0	Unknown	5-10%	Town wide
Hail	5	50%	5-10%	Town wide
Tornado	3	30%	>10%	Town wide
Flood/Flash Flood	8	80%	5-10%	Town wide
Drought/Extreme Heat	15	>100%	5-10%	Town wide
Winter Storm/Frost Freeze/Heavy Snow/Ice Storm/Winter Weather/Extreme Cold	7	70%	5-10%	Town wide
Hurricane/Tropical Storm/Tropical Depression/High Wind/Strong Wind	8	80%	5-10%	Town wide
Sinkhole/Expansive Soil	0	Unknown	<5%	Town wide
Landslide	N/A	N/A	N/A	N/A
Earthquake	1	10%	5-10%	Town wide
Wildfire (2010-2013 – 3 year study period)	54	>100%	5-10%	Town wide
Dam/Levee Failure	0	Unknown	<5%	Town wide
<i>Source: NOAA NCDC; U. S. Inflation Calculator/Consumer Price Index; USGS ; Local Input; USDA Census of Agriculture; Alabama Forestry Commission; and National Forestry Service; Participating Jurisdictions</i>				
Methodology: Number of historical occurrences is those reported by NOAA NCDC during the 10 year study period, with the exception of wildfire that is a 3 year study period. Probability is expressed by dividing the total number of occurrences by the study period in years. Extent is expressed as the percentage assigned by the jurisdictions' ranking in the vulnerability summary (Table 4-12). Zero denotes no data available to determine the probability, extent, or affected area.				

TABLE 5-16: Town of Forkland Critical Facilities

Facility	Location	Use	Value
Governmental Services			
*Forkland Town Hall	13327 US 43N	Local government	\$600,000
*Forkland VFD	13319 US 43N	Fire Fighting & Rescue	\$1,000,000
Forkland PD	Highway 43	Law Enforcement	\$1,200,000
Public Works			
Water Tank	Hwy 43 & Cr 41	Potable Water	\$500,000
Water Treatment	Hwy 43 & Cr 41	Potable Water	\$750,000
Electric Substation	13327 US 43N	Electrical Power	\$1,000,000
Education			
Industrial			
Miscellaneous			
Cell Tower	US Hwy 43 N	Communications	
Cell Tower	County Rd. 41	Communications	
High Speed Internet Tower	Danlap Rd.	Communications	
Outdoor Warning Siren (#4)	13327 US 43N	Weather Warning	\$20,000
Source: Local Jurisdictions			TOTAL \$5,070,000

**Table 5-17: Town of Forkland
Estimated Loss Projections from Specified Hazards**

Natural Hazards	Average Occurrences (Per year)	Total Deaths	Total Injuries	Average Death and Injury Loss (Per event)	Average Crop and Property Loss (Per event)	Projected Loss (Per event)
Thunderstorm	.5	0	0	\$0	\$4,900	\$5,341
Lightning	0	0	0	\$0	\$0	Unknown
Hail	.5	0	0	\$0	\$400	\$436
Tornado	.3	0	2	\$15,450	\$173,667	\$206,138
Flood/Flash Flood	.8	0	0	\$0	\$6,625	\$7,221
Drought/Extreme Heat	1.5	0	0	\$0	\$0	Unknown
Winter Storm/Frost Freeze/Heavy Snow/Ice Storm/Winter Weather/Extreme Cold	.7	0	0	\$0	\$0	Unknown
Hurricane/Tropical Storm/Tropical Depression/High Wind/Strong Wind	.8	0	0	\$0	\$882,375	\$961,789
Sinkhole/Expansive Soil	0	0	0	\$0	\$0	Unknown
Landslide	0	0	0	\$0	\$0	Unknown
Earthquake	.1	0	0	\$0	\$0	Unknown
Wildfire	18.0	0	0	\$0	\$376,200	\$410,058
Dam/Levee Failure	0	0	0	\$0	\$0	Unknown

Sources: NOAA NCDC; U.S. Inflation Calculator/Consumer Price Index; Local Input; USDA Census of Agriculture; Alabama Forestry Commission and National Forestry Service; Alabama Geological Survey

Methodology: Average occurrences were expressed annually by dividing the total number of occurrences by the ten-year period. Deaths and injuries were taken from the hazard event data. Average losses were calculated by dividing the total amount of all damages by the total number of occurrences during the ten-year period with the exception of wildfire which is a 3-year period (average # fires per year x average fire size in acres x \$1,900/acre average). Projected loss expresses an estimated damage amount per future occurrence by converting the average loss figure from a midpoint of 2008 dollars to 2014 dollars (\$1 in 2008 = \$1.09 in 2014...a cumulative rate of inflation of 9%). Zero denotes no data available to determine the average occurrences, average loss or projected loss per event.

Town of Forkland Mitigation Action Plan

The Town of Forkland recognizes the importance of mitigation planning and will incorporate mitigation planning in planning documents as they are revised or initiated.

Mitigation Status

During the plan update, mitigation actions were reviewed in order to identify completed, deferred, or deleted actions from the previous plan and incorporate actions added during annual updates. **Table 5-18** shows the Town of Forkland's updated mitigation actions. During the plan update process no new actions were identified. In the 2009 plan revision, priorities were expressed by numbering 1 as the highest priority – the higher the number, the lower the priority. For this plan revision, the committee decided to assign a new prioritization labeling as one project may be equally as important as another project. As a result, projects will be labeled high, medium, and low in priority.

BENCHMARKING:

Town of Forkland Mitigation Action Plan (2009)

1. Install outdoor warning sirens in Town – *Action ongoing*
2. Construct fire station with short-term storm shelter – *Action revised and ongoing*
3. Install security measures to critical facilities - *Action ongoing*
4. Participate in NFIP program – *Action ongoing*
5. Provide backup generators to critical facilities – *Action ongoing*

During the 2015 plan update, one action was revised and is ongoing; all other actions are ongoing.

Mitigation Strategy – Town of Forkland

Goal 1: Protect life

Objective 1.1 Improve Warning and Emergency Communication Systems

Action 1.1.1 Install outdoor warning sirens throughout the town

Objective 1.2 Reduce impacts of hazards on vulnerable populations

Action 1.2.1 Install/construct short-term individual storm shelter at the fire department

Objective 1.3 Improve disaster response and recovery

Goal 2: Protect property

Objective 2.1 Reduce losses to critical facilities/assets

Action 2.1.1 Install security measures to critical facilities

Objective 2.2 Join NFIP program

Action 2.2.1 Participate in NFIP program

Objective 2.3 Provide and maintain essential public services

Action 2.3.1 Provide backup emergency generators to critical facilities

Objective 2.4 Reduce losses due to drainage problems

Goal 3: Reduce economic impacts of disasters

Objective 3.1 Maintain operations of critical businesses and major employers

Goal 4: Protect environment and natural resources

Objective 4.1 Identify, protect, and properly manage flood plains

Objective 4.2 Enforce local codes and regulations related to NFIP

Goal 5: Increase public preparedness for disasters

Objective 5.1 Continue to train severe weather spotters

Table 5-18: Town of Forkland Mitigation Actions

Mitigation Action 1.1.1	Install outdoor warning sirens throughout the town
Hazard(s) Addressed	All
Applies to new/existing asset	New
Local Planning Mechanism	Greene county EMA, Town of Forkland
Time frame for Completion	One year from funding availability
Estimated Cost	\$30,000 each
Funding Sources	Grants, Local
Priority	Medium
Mitigation Action 1.2.1	Install/construct short-term individual storm shelter at the fire department
Hazard(s) Addressed	All
Applies to new/existing asset	New
Local Planning Mechanism	Greene County EMA, Town of Forkland, Fire Department
Time frame for Completion	Two years from funding availability
Estimated Cost	\$8,000
Funding Sources	Grants, Local
Priority	High
Mitigation Action 2.1.1	Install security measures to critical facilities
Hazard(s) Addressed	Misc man made hazards
Applies to new/existing asset	Existing
Local Planning Mechanism	Town of Forkland
Time frame for Completion	One year from funding availability
Estimated Cost	\$15,000
Funding Sources	Grants, Local
Priority	Low
Mitigation Action 2.2.1	Participate in NFIP
Hazard(s) Addressed	Flood
Applies to new/existing asset	
Local Planning Mechanism	Town of Forkland
Time frame for Completion	Upon identification of SFHA's
Estimated Cost	
Funding Sources	Local
Priority	Low
Mitigation Action 2.3.1	Provide backup emergency generators to critical facilities
Hazard(s) Addressed	All
Applies to new/existing asset	New
Local Planning Mechanism	Town of Forkland
Time frame for Completion	One year from funding availability
Estimated Cost	\$25,000 each
Funding Sources	Grants, Local
Priority	High

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Town of Union

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**Table 5-19: Town of Union
Risk and Vulnerability Overview**

Natural Hazards	Hazard Identification	Prioritized Occurrence Threat	Vulnerability
Thunderstorm	X	5	H
Lightning	X	8	H
Hail	X	6	H
Tornado	X	7	H
Flood/Flash Flood	X	3	L
Drought/Extreme Heat	X	2	M
Winter Storm/Frost Freeze/ Heavy Snow/Ice Storm/Winter Weather/Extreme Cold	X	4	L
Hurricane/Tropical Storm/ Tropical Depression/High Wind/Strong Wind	X	3	L
Sinkhole/Expansive Soil	X	8	L
Landslide	N/A	N/A	N/A
Earthquake	X	7	M
Wildfire	X	1	L
Dam/Levee Failure	N/A	N/A	N/A
Man-made Hazards			
Hazardous Material Release	X	2	L
Arson/Incendiary Attack	X	1	M
Armed Attack	X	4	L
Conventional Bomb	X	3	L
Chemical Agent	X	5	L
Cyberterrorism	X	6	L
Agriterrorism	X	7	L
Biological Agent	X	8	L
Radiological Agent	X	9	L
Nuclear Bomb	X	10	L

Sources: NOAA NCDC Storm Events Database; Alabama Forestry Commission; National Forestry Service; Alabama Geological Survey; Participating Jurisdictions

KEY:

Hazard Identification – Identified by local jurisdictions

Prioritized Occurrence Threat - Hazards are prioritized with the highest threat of occurrence assigned number one based on hazardous events that have occurred within each jurisdiction over the past ten years, with the exception of wildfires that were based on events that have occurred over the past three years. Some natural hazards have equal threats to a jurisdiction; therefore, their threat number will be the same.

Vulnerability – Identified by local jurisdictions. NA – Not Applicable; not a hazard to the jurisdiction; L – Low Risk; little damage potential (damage to less than 5% of the jurisdiction); M – Medium Risk; moderate damage potential (damage to 5-10% of jurisdiction, infrequent occurrence); and H – High Risk; significant risk/major damage potential (damage to over 10% of jurisdiction, regular occurrence)

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TABLE 5-20: TOWN OF UNION HAZARD EVENTS**4 Thunderstorms Events – 01/01/2003 thru 12/31/2013 (4018 days)***(Source: NOAA NCDC Storm Events Database)*

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
COUNTYWIDE	GREENE CO.	AL	05/20/2005	17:19	CST	Thunderstorm Wind	54 kts. EG	0	0	11.00K	0.00K
UNION	GREENE CO.	AL	08/15/2010	20:05	CST-6	Thunderstorm Wind	55 kts. EG	0	0	7.00K	0.00K
UNION	GREENE CO.	AL	04/27/2011	03:50	CST-6	Thunderstorm Wind	60 kts. EG	0	0	15.00K	0.00K
GREENE CO.	GREENE CO.	AL	06/28/2011	12:16	CST-6	Thunderstorm Wind	40 kts. EG	0	0	0.50K	0.00K
Totals:								0	0	33.5K	0.00K

0 Lightning Events – 01/01/2003 thru 12/31/2013 (4018 days)*(Source: NOAA NCDC Storm Events Database)*

No lightning events occurred or were reported during 01/01/2003 thru 12/31/2013.

2 Hail Events – 01/01/2003 thru 12/31/2013 (4018 days)*(Source: NOAA NCDC Storm Events Database)*

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
UNION	GREENE CO.	AL	04/08/2006	00:34	CST	Hail	1.00 in.	0	0	0.00K	0.00K
UNION	GREENE CO.	AL	03/01/2007	15:24	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

1 Tornado Event – 01/01/2003 thru 12/31/2013 (4018 days)*(Source: NOAA NCDC Storm Events Database)*

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
UNION	GREENE CO.	AL	09/25/2005	14:54	CST	Tornado	F0	0	0	0.00K	0.00K
Totals:								0	0	0.00M	0.00K

8 Flood/Flash Flood Events – 01/01/2003 thru 12/31/2013 (4018 days)
(Source: NOAA NCDC Storm Events Database)

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
GREENE (ZONE)	GREENE (ZONE)	AL	04/01/2005	00:00	CST	Flood		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/06/2005	00:00	CST	Flood		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	06/12/2005	06:45	CST	Flood		0	0	20.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	07/11/2005	00:00	CST	Flood		0	0	3.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	04/07/2003	05:00	CST	Flash Flood		0	0	10.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	02/05/2004	21:30	CST	Flash Flood		0	0	0.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	02/06/2004	00:10	CST	Flash Flood		0	0	5.00K	0.00K
COUNTYWIDE	GREENE CO.	AL	07/10/2005	18:00	CST	Flash Flood		0	0	15.00K	0.00K
Totals:								0	0	53.00K	0.00K

15 Drought/Extreme Heat Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
GREENE (ZONE)	GREENE (ZONE)	AL	07/18/2006	07:00	CST	Drought	D-2	0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/01/2006	00:00	CST	Drought	D-3	0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/01/2006	00:00	CST	Drought	D-3	0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	03/27/2007	06:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	05/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	06/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	07/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	10/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	11/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	12/01/2007	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	01/01/2008	00:00	CST-6	Drought		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	02/01/2008	00:00	CST-6	Drought		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

7 Winter Storm/Frost Freeze/Heavy Snow/Ice Storm/Winter Weather/Extreme Cold Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
GREENE (ZONE)	GREENE (ZONE)	AL	01/09/2011	11:15	CST-6	Ice Storm		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	01/19/2008	06:00	CST-6	Winter Weather		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	02/12/2010	11:00	CST-6	Winter Weather		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	02/09/2011	17:15	CST-6	Winter Weather		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	01/24/2003	00:00	CST	Extreme Cold/wind Chill		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/07/2007	00:00	CST-6	Frost/freeze		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	04/08/2007	00:00	CST-6	Frost/freeze		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

**8 Hurricane/Tropical Storm/Tropical Depression/High Wind/Strong Wind Events – 01/01/2003
thru 12/31/2013 (4018 days)**

(Source: NOAA NCDC Storm Events Database)

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
GREENE (ZONE)	GREENE (ZONE)	AL	07/10/2005	15:00	CST	Tropical Storm		0	0	165.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/29/2005	17:00	CST	Tropical Storm		0	0	1.800M	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	08/23/2008	12:00	CST-6	Tropical Depression		0	0	0.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	11/09/2009	14:00	CST-6	Tropical Depression		0	0	1.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/16/2004	06:00	CST	High Wind	77 kts. EG	0	0	5.000M	75.00K
GREENE (ZONE)	GREENE (ZONE)	AL	06/11/2005	14:00	CST	Strong Wind	40 kts. EG	0	0	5.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	03/28/2009	05:30	CST-6	Strong Wind	35 kts. EG	0	0	5.00K	0.00K
GREENE (ZONE)	GREENE (ZONE)	AL	09/05/2011	15:10	CST-6	Strong Wind	39 kts. EG	0	0	8.00K	0.00K
Totals:								0	0	6.984M	75.00K

0 Sinkhole Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database/U.S. Geological Survey)

No sinkhole events occurred or were reported during 01/01/2003 thru 12/31/2013.

0 Landslide Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database/U.S. Geological Survey)

No landslide events occurred or were reported during 01/01/2003 thru 12/31/2013.

1 Earthquake Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database/U.S. Geological Survey)

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
UNION	GREENE COUNTY	AL	03/09/2004		CST	Earthquake	2.6 Mag	0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

No earthquake events were reported to NOAA NCDC during 01/01/2003 thru 12/31/2013.

54 Wildfire Events – 1/1/2010 thru 12/31/2013

(Source: Alabama Forestry Commission)

County	Total # of Fires 2010-2013	Average # of Fires Per Year	Total Acres Burned 2010-2013	Average Acres Burned Per Year	Average Fire Size in Acres
Greene	54	18	604.40	201	11

0 Dam/Levee Failure Events – 01/01/2003 thru 12/31/2013 (4018 days)

(Source: NOAA NCDC Storm Events Database/Local Input)

No dam/levee failure events occurred or were reported during 01/01/2003 thru 12/31/2013.

**Table 5-21: Town of Union
Hazard Probability Assessment**

Natural Hazards	Number of Historical Occurrences	Probability of Future Occurrence	Extent	Area Affected
Thunderstorm	4	40%	>10%	Town wide
Lightning	0	Unknown	>10%	Town wide
Hail	2	20%	>10%	Town wide
Tornado	1	10%	>10%	Town wide
Flood/Flash Flood	8	80%	<5%	Town wide
Drought/Extreme Heat	15	>100%	5-10%	Town wide
Winter Storm/Frost Freeze/Heavy Snow/Ice Storm/Winter Weather/Extreme Cold	7	70%	<5%	Town wide
Hurricane/Tropical Storm/Tropical Depression/High Wind/Strong Wind	8	80%	<5%	Town wide
Sinkhole/Expansive Soil	0	Unknown	<5%	Town wide
Landslide	N/A	N/A	N/A	N/A
Earthquake	1	10%	5-10%	Town wide
Wildfire (2010-2013 – 3 year study period)	54	>100%	<5%	Town wide
Dam/Levee Failure	N/A	N/A	N/A	N/A

Source: NOAA NCDC; U. S. Inflation Calculator/Consumer Price Index; USGS ; Local Input; USDA Census of Agriculture; Alabama Forestry Commission; and National Forestry Service; Participating Jurisdictions

Methodology: Number of historical occurrences is those reported by NOAA NCDC during the 10 year study period, with the exception of wildfire that is a 3 year study period. Probability is expressed by dividing the total number of occurrences by the study period in years. Extent is expressed as the percentage assigned by the jurisdictions' ranking in the vulnerability summary (Table 4-12). Zero denotes no data available to determine the probability, extent, or affected area.

TABLE 5-22: Town of Union Critical Facilities

Facility	Location	Use	Value
Governmental Services			
Union Town Hall	7856 CR 191	Municipal Government	\$500,000
Union VFD	CR 191	Fire Fighting & Rescue	\$750,000
Public Works			
Education			
Industrial			
Miscellaneous			
Union First Baptist Church	CR 208	Shelter	\$100,000
Johnson Hill United Methodist	CR 209	Shelter	\$1,500,000
Hopewell Primitive Baptist	CR 191	Shelter	\$100,000
Outdoor Warning Siren (#3)	7856 CR 191	Weather Warning	\$30,000
Parrish Grocery	CR208/CR191	Food/ Fuel Source	
Source: Local Jurisdictions			
TOTAL			\$2,980,000

**Table 5-23: Town of Union
Estimated Loss Projections from Specified Hazards**

Natural Hazards	Average Occurrences (Per year)	Total Deaths	Total Injuries	Average Death and Injury Loss (Per event)	Average Crop and Property Loss (Per event)	Projected Loss (Per event)
Thunderstorm	.4	0	0	Unknown	\$8,375	\$9,129
Lightning	Unknown	0	0	Unknown	Unknown	Unknown
Hail	.2	0	0	Unknown	Unknown	Unknown
Tornado	.1	0	0	Unknown	Unknown	Unknown
Flood/Flash Flood	.8	0	0	Unknown	\$6,625	\$7,221
Drought/Extreme Heat	1.5	0	0	Unknown	Unknown	Unknown
Winter Storm/Frost Freeze/Heavy Snow/Ice Storm/Winter Weather/Extreme Cold	.7	0	0	Unknown	Unknown	Unknown
Hurricane/Tropical Storm/Tropical Depression/High Wind/Strong Wind	.8	0	0	Unknown	\$882,375	\$961,789
Sinkhole/Expansive Soils	Unknown	0	0	Unknown	Unknown	Unknown
Landslide	Unknown	0	0	Unknown	Unknown	Unknown
Earthquake	.1	0	0	Unknown	Unknown	Unknown
Wildfire (3 year study period)	18.0	0	0	Unknown	\$376,200	\$410,058
Dam/Levee Failure	Unknown	0	0	Unknown	Unknown	Unknown

Sources: NOAA NCDC; U.S. Inflation Calculator/Consumer Price Index; Local Input; USDA Census of Agriculture; Alabama Forestry Commission and National Forestry Service; Alabama Geological Survey

Methodology: Average occurrences were expressed annually by dividing the total number of occurrences by the ten-year period. Deaths and injuries were taken from the hazard event data. Average losses were calculated by dividing the total amount of all damages by the total number of occurrences during the ten-year period with the exception of wildfire which is a 3-year period (average # fires per year x average fire size in acres x \$1,900/acre average). Projected loss expresses an estimated damage amount per future occurrence by converting the average loss figure from a midpoint of 2008 dollars to 2014 dollars (\$1 in 2008 = \$1.09 in 2014...a cumulative rate of inflation of 9%). Zero denotes no data available to determine the average occurrences, average loss or projected loss per event.

Town of Union Mitigation Action Plan

The Town of Union recognizes the importance of mitigation planning and will incorporate mitigation planning in planning documents as they are revised or initiated.

Mitigation Status

During the plan update, mitigation actions were reviewed in order to identify completed, deferred, or deleted actions from the previous plan and incorporate actions added during annual updates. **Table 5-24** shows the Town of Union's updated mitigation actions. During the plan update process no new actions were identified. In the 2009 plan revision, priorities were expressed by numbering 1 as the highest priority – the higher the number, the lower the priority. For this plan revision, the committee decided to assign a new prioritization labeling as one project may be equally as important as another project. As a result, projects will be labeled high, medium, and low in priority.

BENCHMARKING:

Town of Union Mitigation Action Plan (2009)

1. Construct long-term storm shelter with water, kitchen, and generator – *Action revised and ongoing*
2. Install security measures at critical facilities – *Action ongoing*
3. Participate in NFIP program – *Action ongoing*
4. Provide emergency generators at critical facilities – *Action ongoing*
5. Upgrade drainage system to enlarge ditches, storm drains – *Action ongoing*
6. Perform repairs to bridges – *Action ongoing*

During the 2015 plan update, one action was revised and is ongoing; all other actions are ongoing.

Mitigation Strategy – Town of Union

Goal 1: Protect life

Objective 1.1 Improve Warning and Emergency Communication Systems

Objective 1.2 Reduce impacts of hazards on vulnerable populations

Action 1.2.1 Install/construct long-term community safe rooms to include generators and outdoor warning sirens, if needed

Objective 1.3 Improve disaster response and recovery

Goal 2: Protect property

Objective 2.1 Reduce losses to critical facilities/assets

Action 2.1.1 Install security measures at critical facilities

Objective 2.2 Join NFIP program

Action 2.2.1 Participate in NFIP program

Objective 2.3 Provide and maintain essential public services

Action 2.3.1 Provide emergency generators at critical facilities

Objective 2.4 Reduce losses due to drainage problems

Action 2.4.1 Improve drainage systems (enlarge ditches; storm drains)

Action 2.4.2 Repair bridges

Goal 3: Reduce economic impacts of disasters

Objective 3.1 Maintain operations of critical businesses and major employers

Goal 4: Protect environment and natural resources

Objective 4.1 Identify, protect, and properly manage flood plains

Objective 4.2 Enforce local codes and regulations related to NFIP

Goal 5: Increase public preparedness for disasters

Objective 5.1 Continue to train severe weather spotters

Table 5-24: Town of Union Mitigation Actions

Mitigation Action 1.2.1	Install/construct long-term community safe rooms to include generators and outdoor warning sirens, if needed
Hazard(s) Addressed	All
Applies to new/existing	New
Local Planning	Greene County EMA, Town of Union
Time frame for	Two years from funding availability
Estimated Cost	\$150,000 each
Funding Sources	Grants, local
Priority	High
Mitigation Action 2.1.1	Install security measures at critical facilities
Hazard(s) Addressed	Misc. Manmade Hazards
Applies to new/existing	Existing
Local Planning	Town of Union
Time frame for	6 months from funding availability
Estimated Cost	\$15,000
Funding Sources	Grants, local
Priority	Low
Mitigation Action 2.2.1	Participate in NFIP
Hazard(s) Addressed	Flood
Applies to new/existing	New and Existing
Local Planning	Town of Union
Time frame for	Upon identification of SFHA's
Estimated Cost	
Funding Sources	Local
Priority	Medium
Mitigation Action 2.3.1	Provide emergency generators at critical facilities
Hazard(s) Addressed	All
Applies to new/existing	Existing
Local Planning	Greene County EMA, Town of Union
Time frame for	One year from funding availability
Estimated Cost	\$25,000 each
Funding Sources	Grants, local
Priority	Medium
Mitigation Action 2.4.1	Improve drainage systems (enlarge ditches; add storm drains)
Hazard(s) Addressed	Flooding
Applies to new/existing	Existing
Local Planning	Greene County, Town of Union
Time frame for	One Year from funding availability
Estimated Cost	\$100,000
Funding Sources	Grants, Local
Priority	Medium
Mitigation Action 2.4.2	Repair Bridges
Hazard(s) Addressed	Flooding
Applies to new/existing	Existing
Local Planning	Greene County, Town of Union
Time frame for	One year from funding availability
Estimated Cost	\$200,000
Funding Sources	Grants, Local
Priority	Low

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Section Six: Mitigation Plan Maintenance

The HMPC reviewed the Mitigation Plan Maintenance as stated in the 2009 plan update and agreed to the information will remain basically the same for the 2015 plan update, having minor updates. During the past five years, informal meeting were held annually to discuss the hazard mitigation plan and any updates to the plan; however, no sign-in sheets, minutes, or other documentation was kept to verify these meetings were held. No updates or changes to the plan were made as a result of the annual meetings. In the next five years, documentation will be kept to show meetings were held or questionnaires were distributed and their results.

The plan may be reviewed at any time at the request of any jurisdiction, by the Chairman of the Hazard Mitigation Planning Committee, or at the discretion of the Greene County EMA Director. Local governments may submit a formal letter to the Greene County EMA Director or the Chairman of the Greene County Hazard Mitigation Planning Committee requesting a review of the plan. The public may also request review of the plan by submitting a formal letter to the Greene County EMA Director or the Chairman of the Greene County Hazard Mitigation Planning Committee requesting a review of the plan.

The Hazard Mitigation Planning Committee may re-evaluate the plan after a disaster has occurred to make sure that mitigation of the hazard was addressed properly. At the minimum, the Hazard Mitigation Planning Committee will meet on an annual basis to monitor, evaluate, and amend this plan or a questionnaire or survey will be emailed, faxed, or mailed to HMPC members and citizens. Topics to be included on questionnaires or at meetings include the tracking of mitigation actions and their implementation, progress, and barriers in order to take full advantage of available grant opportunities. Questionnaires and meetings will also focus on evaluating the plan's vulnerabilities, capabilities, and mitigation goals. Results of the annual reviews will be made a part of the next plan's update in 2019.

Meetings will be publicized well in advance so the public can attend. Public participation is encouraged to allow the public an opportunity to participate in the process. The Hazard Mitigation Planning Committee will review a variety of resources and examine conditions, which may affect mitigation activities for natural and technological hazards. The committee will review existing plans, policies, maps, and other documentation such as, but not limited to:

- NFIP flood panels
- Post-disaster redevelopment models

- Critical facilities lists and maps
- Existing land-use maps
- Future land-use maps
- Current zoning maps
- Land development codes
- Governing body codes and resolutions
- Comprehensive plans, including drainage studies
- Emergency Operations Plan
- Standard Operating Guidelines
- Various other plans and/or studies related to hazard mitigation

The EMA Director will serve as the point of contact for all amendments to the plan and will coordinate all additions, deletions or amendments of actions to the plan, as needed. The EMA Director will be responsible for informing the local governing bodies of any amendments made to the plan. Any local government seeking to add an action(s) to the plan will be responsible for providing support for the action in the form of a resolution if, and only if, the funding source(s) requires so. The entire plan will be updated on a five-year planning cycle.

The method and schedule for the five-year update to the plan will be determined by the Greene County EMA Director. The EMA Director will elect to either contract out the update of the plan or utilize Greene County staff to perform the update. The plan update will be scheduled well in advance of the plan expiration date in order to allow adequate time for the planning process to be completed.

Incorporation into Existing Planning Mechanisms

The Greene County Hazard Mitigation Plan serves as an annex to the current Greene County Emergency Operations Plan that is administered by the Greene County Emergency Management Agency. The Greene County Hazard Mitigation Plan update has also been incorporated into the District II Comprehensive Economic Development Strategy (CEDS). District II covers the West Alabama counties of Bibb, Fayette, Greene, Hale, Lamar, Pickens, and Tuscaloosa.

Incorporation of the hazard mitigation plan will vary for each jurisdiction based on existing planning methods and processes. Jurisdictions with planning commissions and

respective zoning ordinances and building codes will incorporate mitigation plan elements as appropriate into their review of new developments.

Many jurisdictions have no zoning or existing plans of any type other than this mitigation plan (see Table 1-1) and do not have the resources or funding to prepare them. In these cases, where applicable, the mitigation plan elements will be incorporated into local development decisions by the appropriate local coordinating body in order to determine funding, prioritization, and review of new development activities. At such time as the jurisdiction does adopt zoning and building codes they will reflect the goals and objectives set forth in this plan. Further, any jurisdiction preparing or updating a comprehensive plan will reflect their hazard mitigation goals and objectives in their plan. These updates will occur as budget and time allow.

Continued Public Participation

The plan will be available for the public to view at the Greene County Emergency Operations Center, all City and Town Halls, and the Greene County Courthouse.

The Greene County EMA will hold public meetings annually that coincide with the Local Emergency Planning Committee (LEPC) meetings to keep the public involved in the planning process. The notification of meetings will include, but not be limited to, advertisement in a newspaper of local circulation. Meeting notices will include contact information for those wishing to submit comments.

APPENDIX I

Adopting Resolutions

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APPROVAL & IMPLEMENTATION

The purpose of hazard mitigation is to implement action that eliminate the risk from hazards, or reduce the severity of the effects of hazards on people and property. Mitigation actions are both short-term and long-term activities that reduce the cause or occurrence of hazards; reduce exposure to hazards; or reduce effects of hazards through various means to include preparedness, response and recovery measures.

This plan update applies to all local agencies, boards, commissions, and departments assigned mitigation responsibilities, and to others as designated by the Greene County Commission or Director of the Greene County Emergency Management Agency.

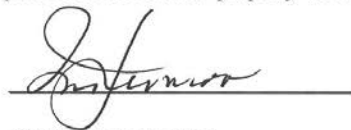
The Greene County Hazard Mitigation Plan Update was prepared in compliance with Public Law 106-390, *Disaster Mitigation Act of 2000*, as amended. This plan update implements hazard mitigation measures intended to eliminate or reduce the effects of future disasters throughout Greene County, and was developed in a joint and cooperative venture by members of the Greene County Hazard Mitigation Planning.

Greene County will comply with all applicable state and federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 44 Code of Federal Regulations (CFR) 13.11c. Greene County will amend its plan whenever necessary to reflect changes in local/state and/or federal laws and statutes as required in 44 CFR, 13.11d. At a minimum, the Greene County EMA will review and if necessary, update the plan every five years from the date of approval in accordance with 44 CFR, 201.6 (5) (d) (3) in order to continue program eligibility.

As the Director of the Greene County Emergency Management Agency, I hereby adopt this plan update in accordance to the powers delegated to me and accept this plan update for implementation in order to protect the lives and property of the citizens of Greene County, Alabama.

16 July 2015

Date



Iris Sermon, Director

Greene County Emergency Management Agency



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County of Greene

2015 Greene County Hazard Mitigation Plan Update

Resolution of Adoption

WHEREAS, the Greene County Hazard Mitigation Plan has been updated in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the County of Greene participated in the updating of a multi-jurisdictional plan, Greene County Hazard Mitigation Plan; and

WHEREAS, the County of Greene is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the plan and the actions in the plan; and

WHEREAS, the County of Greene has reviewed the plan and affirms that the plan will be updated no less than every five years.

NOW THEREFORE, BE IT RESOLVED by the County Commission that the County of Greene adopts the 2015 Greene County Hazard Mitigation Plan Update, and resolves to execute the actions in the plan.

ADOPTED, this 8th day of June, 2015 at the meeting of the County Commission.


Chairman, Greene County Commission



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Town of Boligee
2015 Greene County Hazard Mitigation Plan Update
Resolution of Adoption

WHEREAS, the Greene County Hazard Mitigation Plan has been updated in accordance with FEMA requirements at 44 C.F.R. 201.6; and

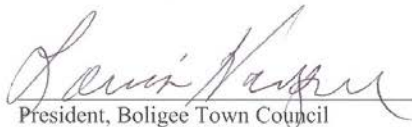
WHEREAS, the Town of Boligee participated in the updating of a multi-jurisdictional plan, Greene County Hazard Mitigation Plan; and

WHEREAS, the Town of Boligee is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the plan and the actions in the plan; and

WHEREAS, the Town of Boligee has reviewed the plan and affirms that the plan will be updated no less than every five years.

NOW THEREFORE, BE IT RESOLVED by the Town Council that the Town of Boligee adopts the 2015 Greene County Hazard Mitigation Plan Update, and resolves to execute the actions in the plan.

ADOPTED, this 17th day of July, 2015 at the meeting of the Town Council.


President, Boligee Town Council



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City of Eutaw

2015 Greene County Hazard Mitigation Plan Update

Resolution of Adoption

WHEREAS, the Greene County Hazard Mitigation Plan has been updated in accordance with FEMA requirements at 44 C.F.R. 201.6; and

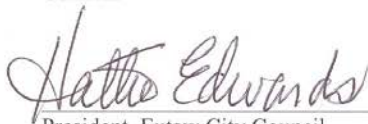
WHEREAS, the City of Eutaw participated in the updating of a multi-jurisdictional plan, Greene County Hazard Mitigation Plan; and

WHEREAS, the City of Eutaw is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the plan and the actions in the plan; and

WHEREAS, the City of Eutaw has reviewed the plan and affirms that the plan will be updated no less than every five years.

NOW THEREFORE, BE IT RESOLVED by the City Council that the City of Eutaw adopts the 2015 Greene County Hazard Mitigation Plan Update, and resolves to execute the actions in the plan.

ADOPTED, this 9th day of June, 2015 at the meeting of the City Council.



President, Eutaw City Council



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Town of Forkland

2015 Greene County Hazard Mitigation Plan Update

Resolution of Adoption

WHEREAS, the Greene County Hazard Mitigation Plan has been updated in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Town of Forkland participated in the updating of a multi-jurisdictional plan, Greene County Hazard Mitigation Plan; and

WHEREAS, the Town of Forkland is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the plan and the actions in the plan; and

WHEREAS, the Town of Forkland has reviewed the plan and affirms that the plan will be updated no less than every five years.

NOW THEREFORE, BE IT RESOLVED by the Town Council that the Town of Forkland adopts the 2015 Greene County Hazard Mitigation Plan Update, and resolves to execute the actions in the plan.

ADOPTED, this 6th day of July, 2015 at the meeting of the Town Council.



President, Forkland Town Council



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Resolution 2015-0714

Town of Union

2015 Greene County Hazard Mitigation Plan Update

Resolution of Adoption

WHEREAS, the Greene County Hazard Mitigation Plan has been updated in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Town of Union participated in the updating of a multi-jurisdictional plan, Greene County Hazard Mitigation Plan; and

WHEREAS, the Town of Union is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the plan and the actions in the plan; and

WHEREAS, the Town of Union has reviewed the plan and affirms that the plan will be updated no less than every five years.

NOW THEREFORE, BE IT RESOLVED by the Town Council that the Town of Union adopts the 2015 Greene County Hazard Mitigation Plan Update, and resolves to execute the actions in the plan.

ADOPTED, this 15th day of July, 2015 at the meeting of the Town Council.



President, Union Town Council



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Greene County Fire Association
2015 Greene County Hazard Mitigation Plan Update
Resolution of Adoption

WHEREAS, the Greene County Hazard Mitigation Plan has been updated in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Greene County Fire Association participated in the updating of a multi-jurisdictional plan, Greene County Hazard Mitigation Plan; and

WHEREAS, the Greene County Fire Association is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the plan and the actions in the plan; and

WHEREAS, the Greene County Fire Association has reviewed the plan and affirms that the plan will be updated no less than every five years.

NOW THEREFORE, BE IT RESOLVED by the Board that the Greene County Fire Association adopts the 2015 Greene County Hazard Mitigation Plan Update, and resolves to execute the actions in the plan.

ADOPTED, this 11th day of June, 2015 at the meeting of the Greene County Fire Association.



President, Greene County Fire Association



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Greene County Board of Education
2015 Greene County Hazard Mitigation Plan Update
Resolution of Adoption

WHEREAS, the Greene County Hazard Mitigation Plan has been updated in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Greene County Board of Education participated in the updating of a multi-jurisdictional plan, Greene County Hazard Mitigation Plan; and

WHEREAS, the Greene County Board of Education is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the plan and the actions in the plan; and

WHEREAS, the Greene County Board of Education has reviewed the plan and affirms that the plan will be updated no less than every five years.

NOW THEREFORE, BE IT RESOLVED by the Board that the Greene County Board of Education adopts the 2015 Greene County Hazard Mitigation Plan Update, and resolves to execute the actions in the plan.

ADOPTED, this 6th day of July, 2015 at the meeting of the Greene County Board of Education.



Superintendent, Greene County Board of Education

