



One Does of DMA and Two Doses of CRS: A "Cure" for a Successful Hazard Mitigation Plan

ASFPM Conference: Session C2
May 21, 2019

Objectives



- Multi-Hazard Mitigation Planning & Community Rating System: similarities and differences
- Blending of the processes: one plan can meet both program requirements
 - Increased public participation
 - Stakeholder buy-in
 - More detailed flood hazard analysis
 - Accelerated implementation schedule
- Maximizing credit for your Local Hazard Mitigation Plan in the CRS Program
- Questions



Comparison:

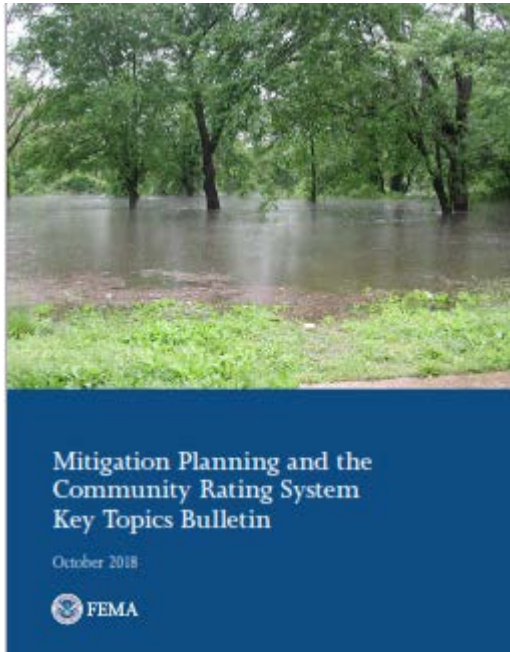


Table 2. FEMA Planning		
	Local Mitigation Planning	CRS Floodplain Management Planning
Objective	Identify local policies and actions that can be implemented to reduce long-term risks and future losses from natural hazards	Produce an overall strategy of programs, projects, and measures that will reduce the adverse impact of the hazard on the community and help meet other community needs
Authority	The Robert T. Stafford Disaster Relief and Emergency Assistance Act , as amended by the Disaster Mitigation Act of 2000	National Flood Insurance Reform Act of 1994, Section 541
Requirements	44 CFR §201.6. Local Mitigation Plans	<i>CRS Coordinator's Manual</i> , Activity 510 (Floodplain Management Planning)
Reference	Local Mitigation Plan Review Guide Local Mitigation Planning Handbook (2013)	<i>CRS Coordinator's Manual</i> , Activity 510 (Floodplain Management Planning)
Hazards Addressed	All natural hazards that can affect the community	Flooding and flood-related hazards, e.g., dam failure, coastal erosion, etc.
Incentive	Reduce the threat to people and losses to property caused by natural hazards	Reduce the threat to people and losses to property caused by floods
Extra Incentive	Prerequisite for FEMA mitigation grants	Reduction in flood insurance premiums
Approval	Review by the State Hazard Mitigation Officer or the state mitigation planning office with final approval by the FEMA Regional office	Approval by the Insurance Services Office, FEMA's contractor for the CRS
Updates	Required every 5 years	Required every 5 years
Requirements Checklist	Plan Review Tool in Local Mitigation Plan Review Guide	<i>510 Floodplain Management Planning Checklist</i> (Appendix 2)
Funding Support	FEMA Hazard Mitigation Assistance (HMA) grants, such as the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) Program, and Flood Mitigation Assistance (FMA)	Same as for mitigation planning, provided the resulting plan meets the FEMA mitigation planning requirements
Website	https://www.fema.gov/hazard-mitigation-planning	https://crsresources.org/500-2/



Available FMP Credit



Table 510-1. Planning steps for mitigation and for the CRS.		
Multi-hazard Mitigation Planning	CRS	Maximum
Phase I – Planning process		
§201.6(c)(1)	1. Organize	15
§201.6(b)(1)	2. Involve the public	120
§201.6(b)(2) & (3)	3. Coordinate	35
Phase II – Risk assessment		
§201.6(c)(2)(i)	4. Assess the hazard	35
§201.6(c)(2)(ii) & (iii)	5. Assess the problem	52
Phase III – Mitigation strategy		
§201.6(c)(3)(i)	6. Set goals	2
§201.6(c)(3)(ii)	7. Review possible activities	35
§201.6(c)(3)(iii)	8. Draft an action plan	60
Phase IV – Plan maintenance		
§201.6(c)(5)	9. Adopt the plan	2
§201.6(c)(4)	10. Implement, evaluate, revise	26
Total		382

2013 and 2017 CRS Manuals:
Average 510 FMP score as of
10/1/18 (all communities credit):

175 points
45% of possible credit

207 points are being left on the
table



Available FMP Credit



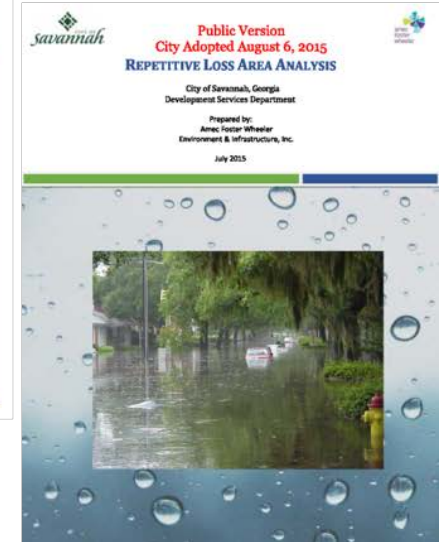
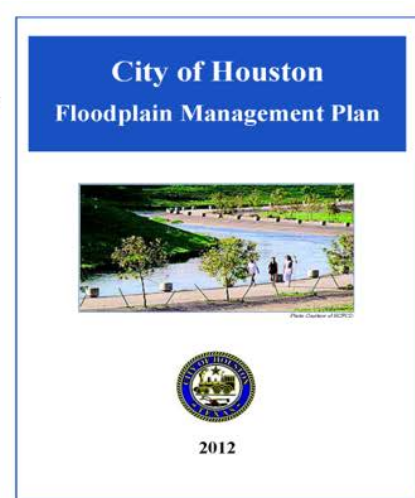
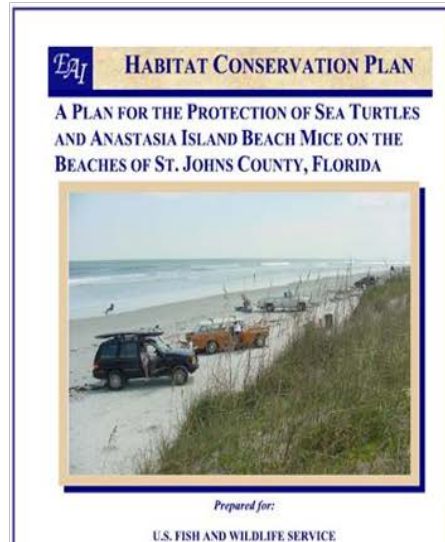
Table 3. Comparison of the Planning Processes

Mitigation Planning Elements*	CRS Planning Steps**	Max Points	Average
A. Planning Process	1. Organize to prepare the plan	15	10
	2. Involve the public	120	34
	3. Coordinate	35	10
	10. Implement, evaluate, revise	26	5
B. Hazard Identification and Risk Assessment	4. Assess the hazard	35	25
	5. Assess the problem	52	29
C. Mitigation Strategy	6. Set goals	2	2
	7. Review possible activities	35	20
	8. Draft an action plan	60	42
D. Plan Update	10. Implement, evaluate, revise 5-year update	See Element A	
E. Plan Adoption	9. Adopt the plan	2	2
		382	171
* The planning elements are per Local Mitigation Plan Review Guide and its Plan Review Tool			
** The 10 steps are detailed in Activity 510, Section 512.a, Floodplain Management Planning (FMP) in the CRS Coordinator's Manual			

31% of total CRS Credit in Activity 510 is in Step 2



Qualifying Plans Under Activity 510



FMP Credit – Only one plan will be credited



Two Types of CRS Credit



CRS Scoring for Local Mitigation Plans

- There are two specific types of credits in FMP:
 - Community specific credits – plan must provide similar detail for all communities participating in the planning process
 - Plan as a whole credits – credit applies to all communities participating in the planning process

Example: Step 4 Assess the Hazard:
a. & b. = Community Specific
c. & d. = Plan as a Whole Credit

- | |
|---------------------------------------------------------------------|
| 4. Assess the hazard. (Max 35) |
| a. Plan includes an assessment of the flood hazard (REQUIRED) with: |
| (1) A map of known flood hazards (5) |
| (2) A description of known flood hazard (5) |
| (3) A discussion of past floods (5) |
| b. Plan includes assessment of less frequent floods (10) |
| c. Plan includes assessment of areas likely to flood (5) |
| d. The plan describes other natural hazards (REQUIRED FOR DMA) (5) |



MHMP Phase 1/CRS Step 1



- MHMP Phase I – Planning Process

- 201.6 (c) (1) The plan shall include documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the planning process, and how the public was involved



CRS Step 1 – Organizing to Prepare the Plan

(a) 4 points, If the office responsible for the community's land use and comprehensive planning is actively involved in the planning process

Plan as whole credit

To obtain 4 points there must be at least one planner or someone who is involved in planning activities on the overall committee



MHMP Phase I/CRS Step 1



- MHMP Phase I – Planning Process

- 201.6 (c) (1) The plan shall include documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the planning process, and how the public was involved

Step 7 Categories

- Preventive measures (e.g., codes)
- Property protection (e.g., elevation)
- Natural resource protection
- Emergency services
- Structural flood control projects
- Public Information

Also see Figure 510-4.

- CRS Step 1 – Organize to Prepare the Plan

- (b) 9 points if the planning process is conducted through a planning committee composed of staff from those community departments that have implement or have expertise in the activities that will be reviewed in step 7

Plan as Whole Credit

Plan needs to be clear as to what implementation or expertise each individual has in terms of the six mitigation categories in step 7



MHMP Phase 1/CRS Step 1



Table 3-2 - Staff Capability with Six Mitigation Categories

Community Department	Prevention	Property Protection	Natural Resource Protection	Emergency Services	Structural Flood Control Projects	Public Information	Other
Collier County Planning & Zoning	✓	✓	✓		✓	✓	✓
Collier County Emergency Management	✓			✓		✓	
Collier County Emergency Services	✓			✓		✓	
Collier County Planning and Project Management	✓	✓	✓		✓	✓	✓
Collier County Stormwater Planning	✓	✓	✓		✓	✓	
Collier County Plan Review and Inspection	✓	✓			✓		
Collier County Communication and Customer Relations						✓	
Marco Island Growth Management	✓	✓	✓	✓	✓	✓	✓
City of Naples Building Department	✓	✓	✓	✓	✓	✓	✓

One way to show expertise



MHMP Phase I/CRS Steps 1 & 2



- The CRS Credits two types of committees

- Step 1 (b)
Staff Planning Committee
- Step 2 (a)
Public Planning Committee

Members on the staff planning committee can also be on the public planning committee



MHMP Phase I/CRS Step 1



- If a community wants credit for participating in a multi-jurisdictional plan (step 1 (b)):
 - The community must send at least two members to the planning committee
 - At least half of the communities representatives must attend all of the planning committee meetings
 - CRS credit for the multi-jurisdictional planning committee will be based on the representation from offices that implement the activities in step 7
 - A county staff member can represent a city staff member provided that person actually works for the city.
 - One person can represent multiple jurisdictions (including consultants); however, that person must have a function within the community represented. The second community representative must be a direct city employee, resident, or elected official



MHMP Phase I/CRS Step 2



- MHMP Phase I – Planning Process

- 201.6 (b) (1) An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval



CRS Step 2 – Involve the Public

- a) Up to 60 points, if the planning process is conducted through a planning committee that includes members of the public (not attached to local government)
- If the committee includes community staff then one-half of the members must come from the public for full credit

Community Specific



MHMP Phase I/CRS Step 2



Public = “stakeholders”

- ✓ Residents
- ✓ Tenants
- ✓ Businesses
- ✓ Civic groups
- ✓ Developers
- ✓ Academia
- ✓ Non-profit
- ✓ State Agency
- ✓ Federal Agency,
- ✓ Etc.



MHMP Phase I/CRS Step 2



Table 2.1 – FMPC Meeting Attendance Record

Member Name	Affiliation	Meeting Date				
		11/29/16	03/15/17	05/17/17	07/25/17	08/17/17
Sheri Armstrong	Lexington County SW/PW	X	X	X	X	X
Jim Barker	Lexington County Public Works	X	X	X		
Susan Cutter	HVRI / University of SC	X				
Bo Davenport	Lexington Co. Emergency Manager	X*				
Robbie Derrick	Lexington Co. Community Dev.	X	X	X*	X	
Joanne Fineburg	Resident, Coldstream HOA		X	X		X
Mark Fuge	Resident, Pineglen Subdivision	X	X		X	X
Melanie Gall	HVRI / University of SC	X				
Guillermo Espinosa	Central Midlands Council of Gov.				X	X
Millie Massey	Resident, Cert Committee	X			X	
Chris Stone	Lexington Co. Floodplain Manager	X	X	X	X	X

*Did not sign in

Note: Melanie Gall was replaced by Guillermo Espinosa following the first FMPC meeting

The credit is pro-rated for lower levels of public participation



MHMP Phase I/CRS Step 2



• MHMP Phase I – Planning Process

CRS Step 2 – Involve the Public

MIAMI HERALD | Miamiherald.com SE SUNDAY, OCTOBER 20, 2013 | 355E

NEIGHBORS CALENDAR
• CALENDAR, FROM 285E

Fall Arts & Crafts Festival
SATURDAY
OCTOBER 26, 11 AM-5 PM
14601 Country Walk Drive
Miami, FL 33186
FREE ADMISSION!
Come & Enjoy: Music, Arts, Crafts, Unique One-Of-A-Kind Items & Gifts, Home Décor, Handmade Jewelry, Food Trucks, Sweet Treats, Gift Ideas For The Holidays And Much More... Fun Zone For Kids - \$4.00 Each For All Day Pass
305-238-9336 Ext. 12
www.countrywalkhoa.org

DENTAL COSMETIC SPA
General - Cosmetic and Emergency Dentistry • Botox • Fillers
50% off Teeth Whitenir
151 Giralda Avenue Coral Gables 786.452.171
www.dentalcosmeticspa.com

VILLAGE OF PINECREST Community Center Master Plan
The Village of Pinecrest is developing a Master Plan for the Pinecrest Community Center. This effort will culminate with a presentation to the Village Council in early 2014. Community meetings have been scheduled to solicit public input. Please join us and attend the meeting that is most convenient for you. All three meetings will include the same presentation and equal opportunity for input.
• Monday, October 28, 2013, 10:00 a.m. to 12:00 noon
• Monday, October 28, 2013, 7:00 p.m. to 9:00 p.m.
• Saturday, November 2, 2013, 2:00 p.m. to 4:00 p.m.
All meetings will be at the Pinecrest Community Center, 5855 Killian Drive, Pinecrest, Florida 33156.
In addition, a survey has been prepared to assist in gathering information for a needs assessment and the evaluation of a potential expansion to the Community Center. The survey is available online at www.pinecrest-fl.gov/PCOMasterPlan. Paper copies of the survey can be obtained at the Pinecrest Community Center.
Guido H. Inguera, Jr., CMC
Village Clerk
pinecrestfl.gov | www.pinecrest-fl.gov

Cutler Bay FLOODPLAIN MITIGATION PLAN NOTICE OF PUBLIC MEETING
The Town of Cutler Bay will hold a meeting of the Floodplain Mitigation Advisory Committee on Thursday, October 24, 2013 at 5:30 pm in the Town Council Chambers, Cutler Bay Town Centre, 10720 Caribbean Blvd., Cutler Bay, FL 33189.
The Committee meeting will be followed at 6:30 pm by a Community Meeting to kick-off the development of the Town of Cutler Bay Floodplain Mitigation Plan and to inform property owners how the 2012 Biggert-Waters Flood Insurance Reform Act may affect them. Interested parties are invited to attend the public meetings or provide written comments to the Town.
The public meeting documents may be inspected by the public at the Town Clerk's Office at 10720 Caribbean Boulevard, Suite 105, Cutler Bay, FL 33189. In accordance with the Americans with Disabilities Act of 1990 (ADA), persons needing special accommodations to participate in these proceedings should contact the Town Clerk's office for assistance at (305) 234-4262 no later than four (4) business days prior to such proceeding.
Debra Eastman, MMC, Town Clerk

b) 15 points, if one or more informational meetings are held in affected area(s) within the first 2 months of the planning process to obtain public input

- The meeting must be held separately from other types of meetings such as the planning committee meeting or any meeting held by the local governing body
- Must be properly advertised

Plan as a whole credit



MHMP Phase I/CRS Step 2



- MHMP Phase I – Planning Process

CRS Step 2 – Involve the Public

(c) 15 points, for holding one or more public meetings to obtain input on the recommended “draft” plan



A newspaper article also can qualify to meet the publicity requirement for step 2 b. and c.



- Simply discussing the plan at public meeting of the local governing body just before it is voted on is not sufficient public input for CRS purposes
- Must be a separate public meeting specifically for this purpose
- Must be properly advertised

Plan as a whole credit



MHMP Phase I/CRS Step 2



• MHMP Phase I – Planning Process

- 201.6 (b) (1) An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval



CRS Step 2 – Involve the Public

(d) 5 points, for each additional public information activity implemented to explain the planning process and encourage input (up to 30 points)

- Website that explains the planning process and posts data such as draft plan
- Conduct a webcast
- Speak to neighborhood groups
- Conduct a questionnaire/survey
- Information booth at festival
- Newspaper Article



MHMP Phase I/CRS Step 2



HMP

[HOME](#)
[AGENDAS, MINUTES, & MORE](#)
[DRAFT DOCUMENTS](#)
[HAZARDS](#)
[PUBLIC SURVEY](#)
[CONTACT US](#)

Next Meeting dates will be posted when available

Outer Banks Regional HMP

Welcome to the website for the 2019 Outer Banks Hazard Mitigation Plan update. The Outer Banks of NC is updating its 2015 plan to better protect the people and property of the region from the effects of natural and human-caused hazards and to maintain eligibility for mitigation funding from the Federal Emergency Management Agency (FEMA). On this website you can find information about upcoming and past Hazard Mitigation Planning Committee meetings and public meetings, take a survey on hazard risk and mitigation options to inform the plan's development, and review draft documents and summaries of the hazards that affect the Outer Banks.

MEETING SCHEDULES, AGENDAS, AND MINUTES

TAKE THE PUBLIC SURVEY

REVIEW DRAFT DOCUMENTS

<div>OPEN</div> Outer Banks Regional Hazard Mitigation Plan Survey Created: 01/18/2019 Modified: 05/14/2019	588	78%	4 mins
	Responses	Completion rate	Typical time spent
<div>OPEN</div> Pamlico Sound Regional Hazard Mitigation Plan Survey Created: 02/05/2019 Modified: 05/13/2019	361	81%	4 mins
	Responses	Completion rate	Typical time spent

Outer Banks Regional Hazard Mitigation Plan Public Survey

Online version can be found at: <https://www.surveymonkey.com/r/OBX-HMP>

Currituck and Dare Counties, along with Dare County local jurisdictions, are developing a Regional Hazard Mitigation Plan to assess and minimize risk to natural hazards, and your participation is important to us. Your input will help us to better understand the vulnerabilities within the Region and how to best mitigate or reduce the impacts of these hazards. **Please help us by completing this survey by Friday, June 14th and returning it to:**

Abby Moore, Wood
 4021 Stirrup Creek Drive, Suite 100, Durham, NC 27703
 Or by email to: abigail.moore@woodplc.com

This survey can also be completed online at: <https://www.surveymonkey.com/r/OBX-HMP>

If you have any questions about this survey or want to learn about more ways to participate in the Outer Banks Regional Hazard Mitigation Plan update, please contact the planning consultant for the project, David Stroud with Wood, at 919-765-9986 or by email at david.stroud@woodplc.com. You can also visit the project website at www.OBX-HMP.com.

BACKGROUND INFORMATION

- Where do you live?

☐ Unincorporated Currituck County
 ☐ Manteo

☐ Unincorporated Dare County
 ☐ Nags Head

☐ Duck
 ☐ Southern Shores

☐ Kill Devil Hills
 ☐ Other: _____

☐ Kitty Hawk
- Do you rent or own your home?

☐ Rent

☐ Own
- How prepared do you feel for a hazard event?

☐ Not at all prepared
 ☐ Somewhat prepared
 ☐ Very prepared
- Do you know where evacuation centers or storm shelters are?

☐ Yes

☐ No
- Are you able to evacuate or take shelter if necessary?

☐ Yes

☐ No
- Do you know where/how to get more information on hazard risk and preparedness?

☐ Yes

☐ No



MHMP Phase I/CRS Step 3



- MHMP Phase I – Planning Process

- 201.6 (b) (1) An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval

CRS Step 3 – Coordinate

(a) 5 points, if the planning includes a review of existing studies, reports and technical information of the community's needs goals and plans for the area

- Where the information from the existing studies and reports is used in the plan
- The review needs to include a review of
 - » Community needs and goals
 - » Past flood studies
 - » Natural areas plans
 - » Other documents that will provide information for the planning process



MHMP Phase I/CRS Step 3



Table 3.7 – Summary of Existing Studies and Plans Reviewed

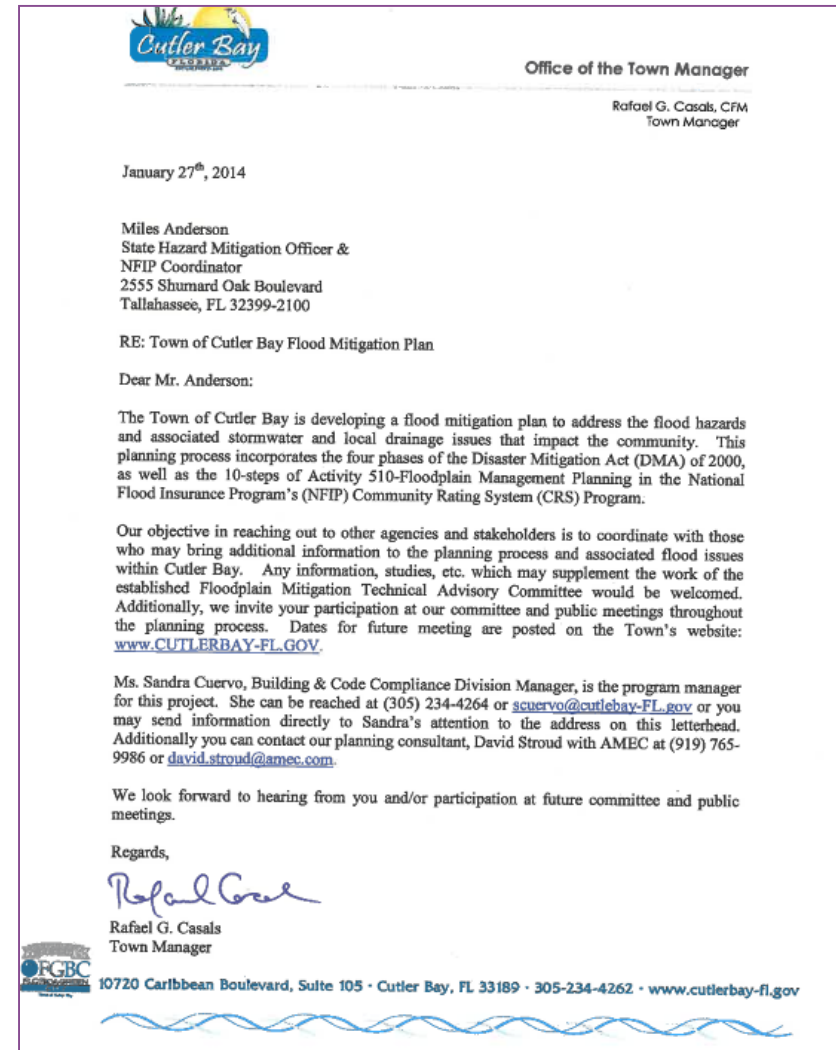
Resource Referenced	Use in this Plan
Chatham County-Savannah Comprehensive Plan, 2016	<ul style="list-style-type: none"> • identify growth and development goals • develop community profile
Chatham County Code Book <ul style="list-style-type: none"> • Zoning Ordinance • Subdivision Regulation • Flood Damage Prevention Ordinance • Land-Disturbing Activities Ordinance • Stormwater Management Ordinance • Soil Erosion and Sedimentation Control Ordinance 	<ul style="list-style-type: none"> • develop capability assessment • develop mitigation strategy
Chatham County Pre-Disaster Hazard Mitigation Plan, 2015	<ul style="list-style-type: none"> • identify flood hazards and develop hazard profiles • develop capability assessment • develop mitigation strategy
Georgia Coastal Hazards Portal	<ul style="list-style-type: none"> • develop erosion hazard profile
Chatham County and Incorporated Areas Flood Insurance Study (FIS), July 2014	<ul style="list-style-type: none"> • develop flood hazard profile and identify flooding sources in the County • DFIRM used to prepare the 100-/500-year flooding vulnerability assessment
Chatham County Emergency Operations Plan, 2012	<ul style="list-style-type: none"> • develop capability assessment • develop mitigation strategy
Chatham County Disaster Recovery Plan, 2015	<ul style="list-style-type: none"> • develop vulnerability assessment • develop capability assessment • develop mitigation strategy



MHMP Phase I/CRS Step 3



- Florida Division of Emergency Management
- FEMA Region IV
- Miami-Dade County Regulatory and Economic Development Agency
- Miami-Dade County Regulatory and Economic Resources Department
- South Florida Water Management District
- American Red Cross, South Florida Region
- National Weather Service
- Miami-Dade County Office of Emergency Management
- US Army Corps of Engineers
- Miami-Dade Public Schools
- Key Biscayne National Park
- Fortis College
- CBT College
- US Fish and Wildlife Service
- NOAA Southeast Fisheries Science Center
- Florida Department of Environmental Protection
- City of Miami Public Works and Waste Management
- Florida Department of Transportation
- South Florida Regional Planning Council





- MHMP Phase II – Risk Assessment

- 201.6 (c) (2) (i) The risk assessment shall include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on all previous occurrences of all hazard events and on the probability of all future hazard events

CRS Step 4 – Assess the Hazard

(a) 15 points for providing and an assessment of the flood hazard in the plan (1) 5 pts (2) 5 pts (3) 5 pts

- The Special Flood Hazard Area (SFHA) show on the FIRM
- Repetitive Loss Areas
- Areas not mapped on the FIRM that have flooded in the past
- Other surface flooding identified in other studies

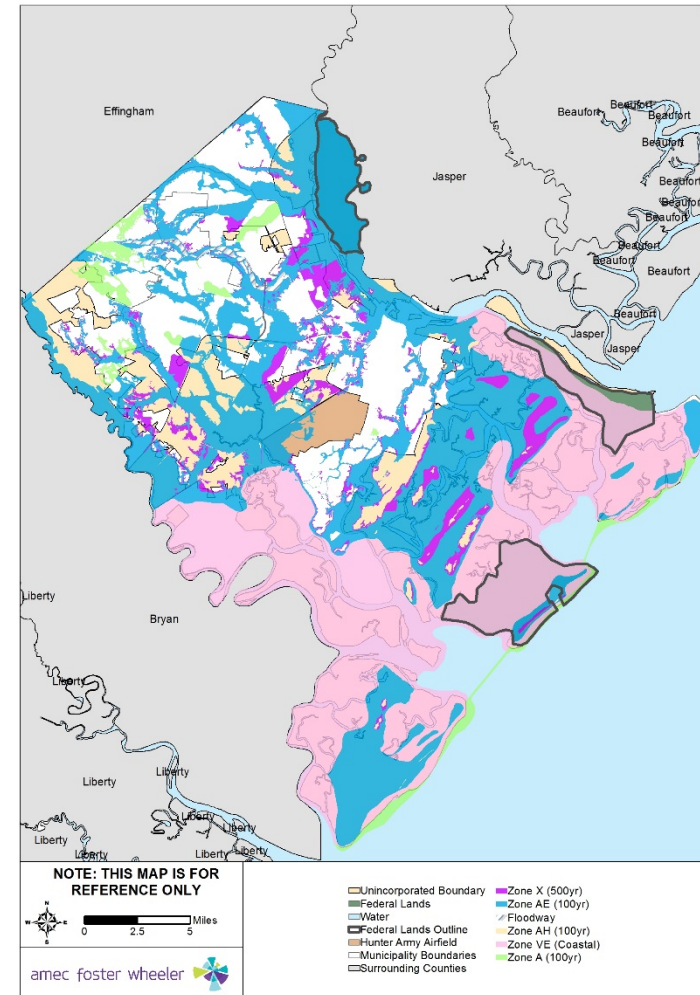


MHMP Phase II/CRS Step 4



- 4 (a) (1) 5 points for a map of the flood hazard area
 - Other assessment information can be in text format

Community specific credit



MHMP Phase II/CRS Step 4

- 4 (a) (1) 5 points for a map of the flood hazard area
 - Other assessment information can be in text format

Community specific credit

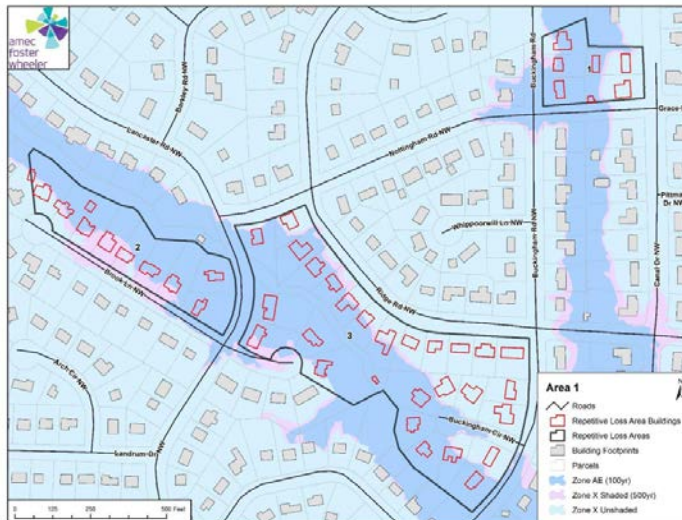
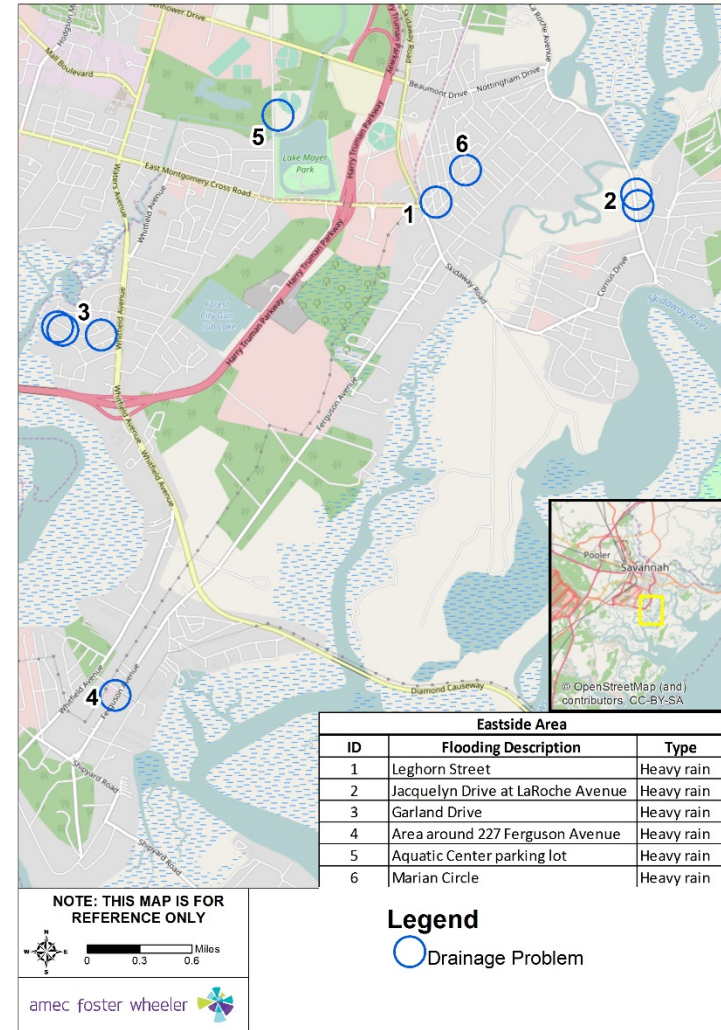


Figure 2.4 - Repetitive Loss Subarea 1



MHMP Phase II/CRS Step 4

- 4 (a) (3) 5 points for a discussion of past floods
 - Detail for each flood event
 - Historical at least 20 years

Community specific credit



April 15, 2013 - A weak upper level trough of low pressure moved across South Florida, stationary frontal boundary over North Florida resulting in isolated severe thunderstorms in the metropolitan region during the afternoon. Nearly six inches of rain fell on Miami Beach during the afternoon and caused significant street flooding.

October 8, 2011 - Heavy and persistent showers led to flooding over southwestern Miami-Dade County. Total rainfall amounts in this area ranged from 5 to 9 inches, with most of this span of 6 hours or less, resulting in significant street flooding.

June 5, 2009 - Severe flooding affected the mid and South Beach sections of Miami Beach as well as downtown Miami from a nearly stationary thunderstorm originating in Biscayne Park. A total of 9.3 inches fell at the cooperative station on South Beach, most of this falling in less than 3 hours. This caused as much as 3 feet of standing water on streets and garages on South Beach, resulting in many vehicles stalled on streets and road closures across the area. Cars were seen floating down Michigan Avenue at 11th Street. Several businesses had water intrusion along Alton Road and 17th Street. A number of condominium buildings along West Avenue had up to 5 feet of water in the parking garages.

October 4, 2008 - An area of heavy rain continued to slowly move south to southeast out of Broward County into Miami-Dade County with rainfall estimates from the National Weather Service radar at two to three inches per hour. On Miami Beach, an off-duty weather service employee reported water entering cars, while more reports of the same were received from Key Biscayne. Several roads were closed with 2 to 3 feet of water for several hours.

September 9-12, 2001 - A stalled trough of low pressure across north Florida gradually shifted to south Florida and eventually spawned tropical storm Gabrielle in the east Gulf of Mexico. Before becoming Gabrielle 5 to 10 inches of rain fell across southeast Florida, causing widespread street flooding.

September 16, 1998 - The ground was well saturated from previous day's rain. Radar rainfall estimated amounts ranging from 4 to 8 inches. Homestead Airforce Base recorded 4.75 inches. At least eight homes were flooded with about 6 inches of water. Widespread street flooding was also reported.

Table 3.2 - FEMA Major Disaster Declarations for Florida, 2002-2014

Hazard Type	Disaster #	Date
Severe Storms, Flooding, Tornadoes and Straight-line Winds	DR-4177	05/06/2014
Severe Storms and Flooding	DR-4138	08/02/2013
Hurricane Isaac	DR-4084	10/18/2012
Tropical Storm Debby	DR-4068	07/03/2012
Severe Storms, Flooding, Tornadoes and Straight-line Winds	DR-1840	05/27/2009
Severe Storms, Flooding, Tornadoes and Straight-line Winds	DR-1831	04/21/2009
Hurricane Gustav	DR-1806	10/27/2008
Tropical Storm Fay	DR-1785	08/24/2008
Severe Storms, Tornadoes and Flooding	DR-1680	02/08/2007
Severe Storms and Tornadoes	DR-1679	02/03/2007
Hurricane Wilma	DR-1609	10/24/2005
Hurricane Katrina	DR-1602	08/28/2005
Hurricane Dennis	DR-1595	07/10/2005
Hurricane Jeanne	DR-1561	09/26/2004
Hurricane Ivan	DR-1551	09/16/2004
Hurricane Frances	DR-1545	09/04/2004
Hurricane Charley and Tropical Storm Frances	DR-1539	08/13/2004
Severe Storms and Flooding	DR-1481	07/29/2003

Source: Florida State Hazard Mitigation Plan, 2014



MHMP Phase II/CRS Step 4



- 4 (b) 10 points for an assessment of less frequent floods

- Identify the hazard

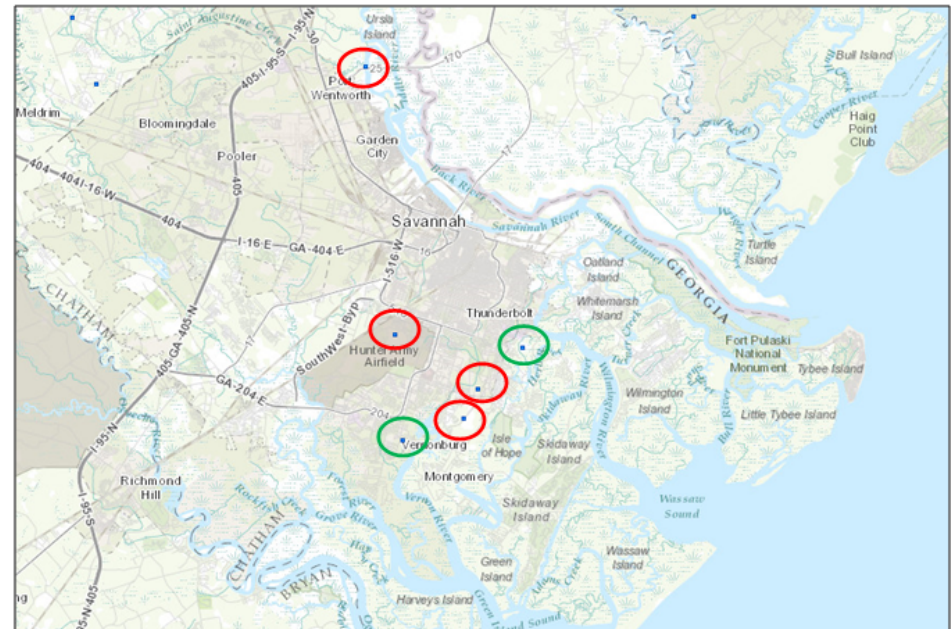
- Levee
- Dam
- Special hazard (Section 401)
- Coastal A-Zone 1.5 – 3.0 foot wave height

- Map the hazard

- Assessment of the hazard

- Summarize the hazard

Community specific credit



Source: U.S. Army Corps of Engineers, National Inventory of Dams

Figure 4.7- National Inventory of Dams for Chatham County

Table 4.5 - National Inventory of Dams, Chatham County

Dam Name	NIDID	Owner	Height (Ft.)	NID Storage (acre-feet)	Dam Type	River
Forest City Gun Club Lake Dam	GA00928	Forest City Gun Club	9.8	273	Earthen	Unknown
Lake Mayer Dam	GA00927	Chatham County	8.9	382	Earthen	—
Pond 29 Dam	GA82309	Fort Stewart / HAAF	19.0	71	Earthen	Off-stream





• MHMP Phase II – Risk Assessment

- 201.6 (c) (2) (ii) The risk assessment shall include a description of Jurisdiction's vulnerability to the hazards described in 201.6 (c) (2) (i). The description shall include an overall summary of each hazard and impact on the community. The plan shall include the vulnerability in terms of: (A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the hazard areas;
- (B) an estimate of the potential losses to vulnerable structures identified in paragraph (C) (2) (ii) (A) of this Section and a description of the methodology used to prepare the estimate; Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions
- 201.6 (c) (2) (iii) For multi-jurisdictional plans, the risk assessment section, must assess each jurisdiction's risks where they vary from risks affecting the entire planning area



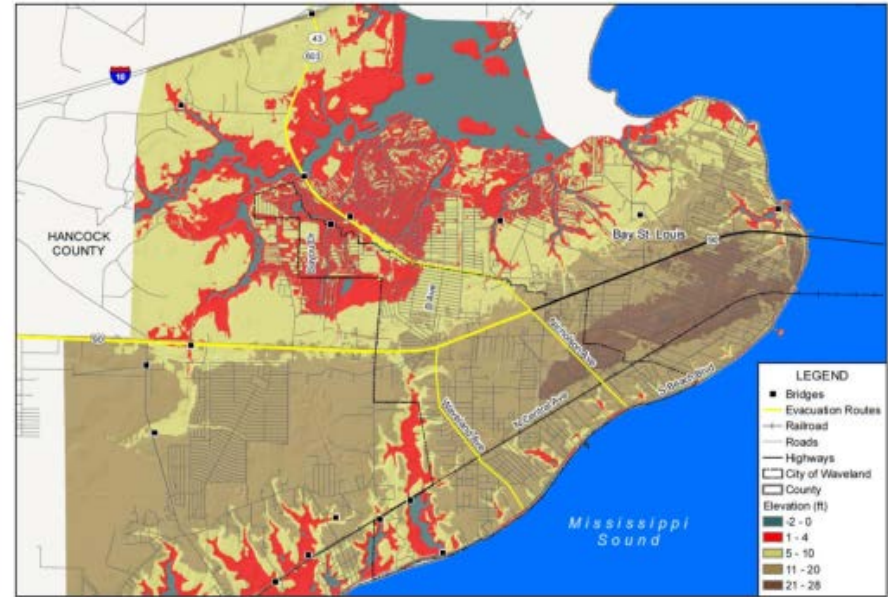
MHMP Phase II/CRS Step 5



- CRS Step 5
 - (b) (1) 5 points for life, safety and the need for warning and evacuating residents and visitors

Community specific credit

- (b) (2) 5 points for public health, including health hazard to individuals from flood waters and mold
- Plan as whole credit



5.7.2 Public Health

Certain health hazards are common to flood events. While such problems are often not reported, three general types of health hazards accompany floods. The first comes from the water itself. Floodwaters carry anything that was on the ground that the upstream runoff picked up, including dirt, oil, animal waste, and lawn, farm and industrial chemicals. Pastures and areas where farm animals are kept or their wastes are stored can contribute polluted waters to the receiving streams.

Floodwaters also saturate the ground, which leads to infiltration into sanitary sewer lines. When wastewater treatment plants are flooded, there is nowhere for the sewage to flow. Infiltration and lack of treatment can lead to overloaded sewer lines that can back up into low-lying areas and homes. Even when it is diluted by flood waters, raw sewage can be a breeding ground for bacteria such as *e.coli* and other disease causing agents. Residents with private wells will need to have their water quality tested to ensure it is safe for use.

The second type of health problem arises after most of the water has gone. Stagnant pools can become breeding grounds for mosquitoes, and wet areas of a building that have not been properly cleaned breed mold and mildew. A building that is not thoroughly cleaned becomes a health hazard, especially for small children and the elderly.



MHMP Phase II/CRS Step 5



- CRS Step 5

- (b) (3) 5 points for critical facilities and infrastructure
- (b) (4) 5 points for the community's economy and major employers
- (b) (5) 5 points numbers, types of structures subject to flood damage

- Plans and procedures for protecting and removing critical facilities
- List of major employers for every community
- Occupancy (residential, commercial, governmental, etc.)

Community specific credits



MHMP Phase II/CRS Step 5



• CRS Step 5

- (C) 5 points if the assessment includes a review of all historical damage including all properties that have received flood insurance claims payments

Community specific credit

Table 5.8 – Estimated Building Damage and Content Loss

Occupancy Type	Total Number of Buildings with Loss	Total Value (Building & Contents)	Estimated Building Damage	Estimated Content Loss	Estimated Total Damage	Loss Ratio
Agricultural	73	\$37,832,008	\$2,937,363	\$8,298,888	\$11,236,251	29.7%
Commercial	542	\$232,663,013	\$8,284,789	\$25,826,279	\$34,111,068	14.7%
Education	56	\$58,941,192	\$2,401,055	\$15,177,131	\$17,578,186	29.8%
Government	0	--	--	--	--	--
Industrial	715	\$626,046,635	\$27,695,636	\$55,716,850	\$83,412,486	13.3%
Religious	0	--	--	--	--	--
Residential	7078	\$2,338,943,317	\$400,112,028	\$218,105,946	\$618,217,974.00	26.4%
Total	8464	\$3,294,426,165	\$441,430,871	\$323,125,094	\$764,555,965	23.2%

Source: Hazus v.2, FEMA 2014 Effective DFIRM

Table 5.12 – NFIP Policy and Claims Data by Occupancy Type – Chatham County

Occupancy	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Single Family	15,402	\$11,078,385	\$4,545,986,800	757	\$9,398,374.52
2-4 Family	169	\$78,305	\$34,836,100	17	\$105,998.89
All Other Residential	1,115	\$388,635	\$192,432,200	13	\$428,844.33
Non-Residential	401	\$657,619	\$174,532,400	40	\$1,322,462.17
Total	17,087	\$12,202,944	\$4,947,787,500	827	\$11,255,678.00

Source: FEMA Community Information System as of 03/31/2017

Table 5.13 – NFIP Policy and Claims Data by Flood Zone – Chatham County

Flood Zone	Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
A01-30 & AE Zones	11,391	\$9,249,167	\$3,133,347,700	502	\$7,158,535.05
A Zones	15	\$17,752	\$3,991,800	20	\$312,398.47
AO Zones	0	\$0	\$0	0	\$0.00
AH Zones	0	\$0	\$0	0	\$0.00
AR Zones	0	\$0	\$0	0	\$0.00
A99 Zones	0	\$0	\$0	0	\$0.00
V01-30 & VE Zones	159	\$607,952	\$42,551,400	5	\$89,477.97
V Zones	0	\$0	\$0	0	\$0.00
D Zones	0	\$0	\$0	0	\$0.00
B, C & X Zone					
Standard	239	\$323,848	\$65,088,400	61	\$767,912.29
Preferred	5,279	\$2,001,825	\$1,702,675,000	224	\$2,880,651.62
Total	17,083	\$12,200,544	\$4,947,654,300	812	\$11,208,973.00

Source: FEMA Community Information System as of 03/31/2017



MHMP Phase 1/CRS Step 2

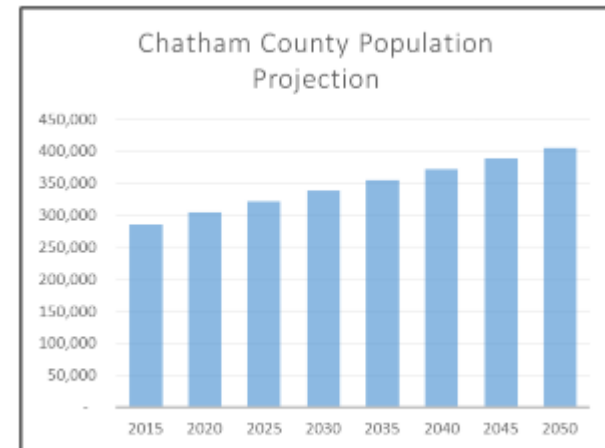


- CRS Step 5

- (e) 7 points if the assessment includes a description of the development, redevelopment, and population trends, and a discussion of what the future brings for development and redevelopment in the community, the watershed, and natural resource areas

Community specific credit

- Comprehensive discussion
- Population projections
- Future development / future land use, etc.



Source: Georgia Governor's Office of Planning and Budget, 2017

Figure 2.10 – Population Projections for Chatham County



MHMP Phase III/CRS Step 7



- MHMP Phase III – Mitigation Strategy

- 201.6 (c) (3) (ii) The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with the particular emphasis on new and existing building and infrastructure

- CRS Step 7 – Review Possible Activities

- Credit for this step is the total of the following based on which floodplain management or hazard mitigation activities are reviewed in the plan (maximum credit 35 points)
- Must describe those activities which were considered

Plan as a whole credit



MHMP Phase III/CRS Step 7



No CRS credit for providing this listing of the 6 mitigation categories or something similar

1. **Preventive** activities keep flood problems from getting worse. The use and development of flood-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.
 - Floodplain mapping and data
 - Open space preservation
 - Floodplain regulations
 - Erosion setbacks
 - Planning and zoning
 - Stormwater management
 - Drainage system maintenance
 - Building codes
2. **Property protection** activities are usually undertaken by property owners on a building-by-building or parcel basis.
 - Relocation
 - Acquisition
 - Building elevation
 - Retrofitting
 - Sewer backup protection
 - Insurance
3. **Natural resource protection** activities preserve or restore natural areas or the natural functions of floodplain and watershed areas. They are implemented by a variety of agencies, primarily parks, recreation, or conservation agencies or organizations.
 - Wetlands protection
 - Erosion and sediment control
 - Natural area preservation
 - Natural area restoration
 - Water quality improvement
 - Coastal barrier protection
 - Environmental corridors
 - Natural functions protection
4. **Emergency services** measures are taken during an emergency to minimize its impact. These measures are usually the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.
 - Hazard threat recognition
 - Hazard warning
 - Hazard response operations
 - Critical facilities protection
 - Health and safety maintenance
 - Post-disaster mitigation actions
5. **Structural projects** keep flood waters away from an area with a levee, reservoir, or other flood control measure. They are usually designed by engineers and managed or maintained by public works staff.
 - Reservoirs
 - Levees/floodwalls
 - Diversions
 - Channel modifications
 - Storm drain improvements
6. **Public information** activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of local floodplains. They are usually implemented by a public information office.
 - Map information
 - Outreach projects
 - Real estate disclosure
 - Library
 - Technical assistance
 - Environmental education





- Step 7 CRS Section (a) is required under this step
 - (a) 5 points if the plan reviews preventative activities such as zoning, stormwater management, building codes, subdivision ordinances, and preservation of open space, and the effectiveness of current regulatory and preventative standards and programs. For this credit, the review must include a discussion of the community's **(Required for any credit in this step)**
 - Comprehensive or land use plan
 - Building code
 - Zoning ordinance
 - Floodplain management regulations
 - Subdivision ordinance
 - Stormwater management regulations
 - (b) 5 points if the plan reviews whether the community's floodplain management regulatory standards are sufficient for current and future conditions (steps 4 (c) and 5 (f))
 - (c) through (g) property protection, natural resources, emergency services, structural projects, and outreach and education



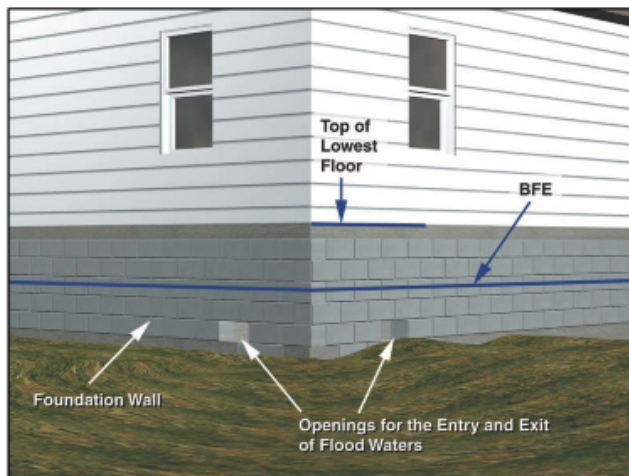
MHMP Phase III/CRS Step 7



Building Codes

Building codes provide one of the best methods for addressing natural hazards. When properly designed and constructed according to code, the average building can withstand many of the impacts of natural hazards. Hazard protection standards for all new and improved or repaired buildings can be incorporated into the local building code. Building codes can ensure that the first floors of new buildings are constructed to be higher than the elevation of the 100-year flood (the flood that is expected to have a one percent chance of occurring in any given year). This is shown in Figure B.1.

Just as important as having code standards is the enforcement of the code. Adequate inspections are needed during the course of construction to ensure that the builder understands the requirements and is following them. Making sure a structure is properly elevated and anchored requires site inspections at each step.



Source: FEMA Publication: Above the Flood: Elevating Your Floodprone House, 2009

Figure B.1 – Building Codes and Flood Elevations

As of February 26, 2016, Chatham County has adopted the current edition of the International Building Code. In accordance with the IBC, the ground immediately adjacent to the foundation shall be sloped away from the building at a slope of not less than one unit vertical in 20 units horizontal (5-percent slope) for a minimum distance of 10 feet measured perpendicular to the face of the wall. If physical obstructions or lot lines prohibit 10 feet of horizontal distance, a 5-percent slope shall be provided to an approved alternative method of diverting water away from the foundation. Swales used for this purpose shall be sloped a minimum of 2 percent where located within 10 feet of the building foundation. Impervious surfaces within 10 feet of the building foundation shall be sloped a minimum of 2-percent away from the building.

Table B.1 – Prevention Mitigation Options and Recommended Projects

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
Prevention Measures Considered by FMPC and Not Recommended			
-	Encourage voluntary compliance with floodplain development regulations.	Could save money on enforcement but would not guarantee compliance with standards.	n/a
-	Manage growth and development in the County through a constantly updated Master Plan.	Limited staff resources to support constant updates to a Master Plan.	n/a
-	Regulate development within Chatham County's coastal barrier areas	Development of a sea level rise adaptation plan instead would enable better-informed regulation of these and other at-risk areas.	n/a

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
Prevention Measures and Funding Recommended for Implementation			
3	Update and enforce building codes and Flood Damage Prevention Ordinance and consider higher regulatory standards to better protect existing and future development.	By updating these regulations to require higher standards, such as an increased freeboard or elevation of electrical equipment, and by enforcing these codes throughout the development process to ensure compliance, Chatham County can limit the vulnerability of new development to flooding.	Operating Budget
4	Continue to enforce Flood Damage Prevention requirements through on-site floodplain inspections.	Increased enforcement of development regulations will ensure that new development will be less vulnerable to flooding.	Operating Budget
6	Improve stormwater management regulations to include higher standards for design storm, size of development regulated, low-impact development, and public maintenance of detention and retention facilities.	Incorporating higher standards into stormwater management regulations will help to minimize the stormwater runoff generated by new development and can potentially provide for on-site stormwater management to mitigate existing problems.	Operating Budget
7	Create new drainage maintenance SOP to include natural drainage features within unincorporated Chatham County.	Expanding drainage maintenance procedures to include natural drainage features will reduce the risk of flooding by ensuring the entire drainage system is functioning properly.	Operating Budget
12	Enact deed restrictions and other growth management tools to preserve wetland and natural resource areas and conserve their natural and ecological functions.	Preserving wetlands and natural resource areas will protect these important areas for future flood protection and continued water quality improvement.	Operating Budget
14	Integrate the FMP into the Emergency Operations Plan, Pre-Disaster Hazard Mitigation Plan, Comprehensive Plan, and Capital Improvement Program.	Integrating planning efforts can be incorporated easily into regular updates. It will help to reinforce the goals, objectives, and actions of this plan and increase the ease and likelihood of implementation.	Operating Budget
21	Develop a long-range regional plan for sea level rise which evaluates multiple adaptation methods.	Analyzing exactly which areas and properties are at risk and then planning and implementing adaptation strategies accordingly can protect the County from suffering the full impact of sea level rise.	-



MHMP Phase IV/CRS Step 9



- CRS Step 10 – Implement, Evaluate and Revise

(b) Up to 24 points if the same or similar planning committee meets to discuss the implementation of the plan.

- 6 points annual review of plan
- 12 points review of the plan twice in one year
- 18 points for review of the plan 3 times in one year
- 24 points for quarterly review of the plan



Let's Up the Average



Table 3. Comparison of the Planning Processes

Mitigation Planning Elements*	CRS Planning Steps**	Max Points	Average
A. Planning Process	1. Organize to prepare the plan	15	10
	2. Involve the public	120	34
	3. Coordinate	35	10
	10. Implement, evaluate, revise	26	5
B. Hazard Identification and Risk Assessment	4. Assess the hazard	35	25
	5. Assess the problem	52	29
C. Mitigation Strategy	6. Set goals	2	2
	7. Review possible activities	35	20
	8. Draft an action plan	60	42
D. Plan Update	10. Implement, evaluate, revise 5-year update	See Element A	
E. Plan Adoption	9. Adopt the plan	2	2
		382	171
<p>* The planning elements are per Local Mitigation Plan Review Guide and its Plan Review Tool</p> <p>** The 10 steps are detailed in Activity 510, Section 512.a, Floodplain Management Planning (FMP) in the CRS Coordinator's Manual</p>			



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