U.S. Department of Homeland Security
FEMA Region IV
3003 Chamblee Tucker Road
Atlanta, GA 30341

FEMA

June 22, 2015

Mr. Miles Anderson
State Hazard Mitigation Officer
Division of Emergency Management
2555 Shumard Oak Boulevard
Tallahassee, Florida 32399-2100

Reference: Town of Cutler Bay FL Flood Mitigation Assistance (FMA) Strategy

Dear Mr. Anderson:

We are pleased to inform you that the Town of Cutler Bay FL Flood Mitigation Assistance (FMA) Plan is in compliance with the federal hazard mitigation planning requirements, as contained in 44 CFR §78.5, revised as of October 1, 2007. The FMA plan is approved pursuant to 44 CFR §78.6. This letter is to confirm the Town of Cutler Bay FL FMA is in accordance with the Program Administration by States (PAS) requirements.

We encourage the Town of Cutler Bay, located in Miami-Dade County, planning committee to incorporate this revised and approved flood mitigation plan into their 2015 updated multi-jurisdictional hazard mitigation plan. As of October 1, 2008, per 44 CFR § 79.6 (c), FMA planning grants are limited to those activities necessary to develop or update the flood portion of any mitigation plan.

The State and the participants in the Town of Cutler Bay FMA plan update are to be commended for their coordination and communications with our office in the review and subsequent approval of the FMA plan. If you or the participants of the Town of Cutler Bay have any questions or need any additional information please do not hesitate to contact Gabriela Vigo, of the Hazard Mitigation Assistance Branch, at (229) 225-4546, or Linda L. Byers of my staff at (770)-220-5498.

Sincerely,

Robert E. Lowe, Chief
Risk Analysis Branch
Mitigation Division

STATE OF FLORIDA

DIVISION OF EMERGENCY MANAGEMENT

RICK SCOTT
Governor

BRYAN W. KOON
Director

June 24, 2015

Ms Lakeesha Morris
Floodplain Mitigation Coordinator
10720 Caribbean Boulevard, Suite 201
Cutler Bay, Florida 33189

Re: Town of Cutler Bay Floodplain Mitigation Plan Approval Notification

Dear Ms. Morris:

Congratulations! The enclosed letter constitutes the Federal Emergency Management Agency's (FEMA) formal approval of the Town of Cutler Bay Floodplain Mitigation Plan.

The mitigation planning unit would like to thank you for all of your hard work. It has been a pleasure working with you and we look forward to serving you in the future. If you have any questions regarding this matter, please contact David M. Block at 850-413-9959 or David.Block@em.myflorida.com.

Respectfully,

Miles E. Anderson,
Bureau Chief, Mitigation
State Hazard Mitigation Officer

MEA/dmb

Attachments: FEMA letter

Floodplain Mitigation Plan

Town of Cutler Bay, FL

May 2015
Adopted via Resolution #15-27

FEMA

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EXECUTIVE SUMMARY

The purpose of this Floodplain Mitigation Plan is to reduce or eliminate risk to people and property from flood hazards. Every community faces different hazards and every community has different resources to draw upon in combating problems along with different interests that influence the solutions to those problems. Because there are many ways to deal with flood hazards and many agencies that can help, there is no one solution for managing or mitigating their effects. Planning is one of the best ways to develop a customized program that will mitigate the impacts of flood hazards while taking into account the unique character of a community. The plan provides a framework for all interested parties to work together and reach consensus on how to move forward. A well prepared flood mitigation plan will ensure that all possible activities are reviewed and implemented so that the problem is addressed by the most appropriate and efficient solutions. It can also ensure that activities are coordinated with each other and with other goals and activities, preventing conflicts and reducing the costs of implementing each individual activity.

The Town of Cutler Bay (Town) followed the planning process prescribed by the Federal Emergency Management Agency (FEMA), and this plan was developed under the guidance of a Floodplain Mitigation Planning Committee (FMPC) comprised of representatives of Cutler Bay Departments, citizens and other stakeholders. The FMPC conducted a risk assessment that identified and profiled flood hazards that pose a risk to the Town, assessed the Town's vulnerability to these hazards, and examined the capabilities in place to mitigate them. The flood hazards profiled in this plan include:

- Climate Change and Sea Level Rise
- Coastal/Canal Bank Erosion
- Dam/Levee Failure
- Flood: 100/500 year
- Flood: Stormwater/ Localized Flooding
- Hurricane and Tropical Storms (including Storm Surge)

This plan identifies activities that can be undertaken by both the public and the private sectors to reduce safety hazards, health hazards, and property damage caused by floods. Based on the risk assessment developed for each of the flood hazards identified above, the FMPC identified goals and objectives for reducing the Town's vulnerability to the hazards. The goals and objectives are summarized as follows:

Goal 1 – Protect the health, safety and welfare of the citizens of Cutler Bay from the effects of flooding

- Objective 1.1: Reduce flood damage to insurable buildings and public infrastructure through stormwater improvement projects
- Objective 1.2: Preserve open space areas, especially where there are sensitive natural areas
- Objective 1.3: Promote higher development and design standards to protect new buildings from flood damage

Goal 2 – Promote a public education program to encourage residents to undertake mitigation measures that reduce the effects of flood damage on private property

- Objective 2.1: Encourage residents to assume an appropriate level of responsibility for their own flood protection

- Objective 2.2: Promote flood insurance as a property protection measure against potential flood damage

- Objective 2.3: Develop a public education program for the local schools

Goal 3 – Protect critical and essential facilities from flood damage

- Objective 3.1: Seek county, state and federal support for mitigation projects

- Objective 3.2: Prioritize critical and essential facilities in need of protection from potential flood damage

Goal 4 – Reduce the number of repetitively flooded structures

- Objective 4.1: Leverage local, state and federal grant funding to facilitate mitigation actions such as elevation, acquisition, or floodproofing

- Objective 4.2: Target repetitive loss properties for implementation of mitigation projects

In order to meet the identified goals, this plan recommends 17 mitigation actions, which are summarized in the table that follows.

This plan has been formally adopted by the Town and will be updated every five years at a minimum.

Summary of Cutler Bay Mitigation Actions					
Action	**Related to Goal**	**Address Current Development**	**Address Future Development**	**Continued Compliance with NFIP**	**Mitigation Category**
Identify segments of canals where erosion is causing banks to collapse and prepare a prioritized list for improvements	1 & 4	Y	Y	N	Property Protection and Natural Resource Protection
Cleanout all storm drains on a bi-annual basis	1, 3 & 4	Y	Y	Y	Preventative and Property Protection
Improve drainage along the C-100 canal through a dredging project	1, 3 & 4	Y	Y	Y	Preventative, Property Protection and Structural Projects
Improve drainage in the Saga Bay sub basin through upgraded stormwater piping	1 & 4	Y	Y	Y	Preventative, Property Protection, and Structural Projects
Implement program to identify all catch basins located on private streets in gated communities	1 & 4	Y	N	N	Preventative
Continue implementation of drainage system maintenance on all surface water channels, canals and ditches	1, 3 & 4	Y	Y	Y	Preventative and Property Protection
Improve drainage along SW 212th Street with construction of a new outfall	1, 3 & 4	Y	Y	Y	Preventative, Property Protection, and Structural Projects
Promote an Enviro-Scape model to elementary school students	2	N	N	N	Public Information and Outreach
Work with local, state and federal partners to target repetitive loss properties for acquisition or elevation	2 & 4	Y	N	Y	Property Protection
Promote retrofitting techniques for floodproofing of residential structures	2 & 4	Y	N	Y	Property Protection
Revise local codes to require landscapers to obtain licenses	1 & 2	Y	Y	N	Preventative and Public Information and Outreach
Work with the Miami-Dade Association of Realtors to require flood zones to be included in a MLS	1 & 2	Y	Y	N	Public Information and Outreach

Summary of Cutler Bay Mitigation Actions					
Action	**Related to Goal**	**Address Current Development**	**Address Future Development**	**Continued Compliance with NFIP**	**Mitigation Category**
Promote the purchase of flood insurance to residents and businesses	1, 2 & 3	Y	Y	Y	Property Protection and Public Information and Outreach
Protect the natural floodplain functions within the Town including the Cutler Wetlands	1, 2, 4	Y	Y	Y	Natural Resource Protection
Increase awareness of the flood hazard through development of a Program for Public Information PPI	1 and 2	Y	N	Y	Public Information and Outreach
Work with Miami-Dade County Emergency Management on identifying vulnerable populations for evacuations	1 and 2	Y	N	N	Emergency Services and Public Information and Outreach
Work with Miami-Dade County Emergency Management, state and federal governments, to protect vulnerable critical facilities	1 and 3	Y	N	N	Emergency Services

This plan fulfills the requirements of Section 104 of the Disaster Mitigation Act of 2000 and qualifies for CRS credit. The following table provides the 10-step CRS planning credit activity checklist and the section/page number within this plan that describes the completion of each planning step in more detail.

CRS Planning Credit Activity Checklist

CRS Step	Section/Page
1. Organize to prepare the plan.	
a. Involvement of office responsible for community planning	Section 2.1 / page 8
b. Planning committee of department staff	Section 2.1 / page 8
c. Process formally created by the community's governing board	Section 2.2.1 / page 9
2. Involve the public.	
a. Planning process conducted through a planning committee	Section 2.1 / page 8; Section 2.2.1 / Table 2.3
b. Public meetings held at the beginning of the planning process	Section 2.2.1 / Table 2.4
c. Public meeting held on draft plan	Section 2.2.1 / Table 2.4
d. Other public information activities to encourage input	Section 2.2.1 / Table 2.5
3. Coordinate with other agencies.	
a. Review of existing studies and plans	Section 2.2.1 / page 16
b. Coordinating with communities and other agencies	Section 2.2.1 / page 15
4. Assess the hazard.	
a. Plan includes an assessment of the flood hazard with:	Sections 3.1 – 3.2
(1) A map of known flood hazards	Sections 3.1 – 3.2
(2) A description of known flood hazard	Sections 3.1 – 3.2
(3) A discussion of past floods	Sections 3.1 – 3.2
b. Plan includes assessment of less frequent floods	Sections 3.1 – 3.2
c. Plan includes assessment of areas likely to flood	Section 3.2.7
d. The plan describes other natural hazards	----
5. Assess the problem.	
a. Summary of each hazard identified in the hazard assessment and their community impact	Section 3.3
b. Description of the impact of the hazards on:	Section 3.3
(1) Life, safety, health, procedures for warning and evacuation	Section 3.3
(2) Public health including health hazards to floodwaters/mold	Section 3.2.4
(3) Critical facilities and infrastructure	Section 3.3
(4) The community's economy and tax base	Section 1.3.4
(5) Number and type of affected buildings	Section 3.3
c. Review of all damaged buildings/flood insurance claims	Section 3.3
d. Areas that provide natural floodplain functions	Section 3.3
e. Development/redevelopment/Population Trends	Section 3.3
f. Impact of future flooding conditions outline in Step 4, item c	Section 3.3
6. Set goals.	Section 4.2
7. Review possible activities.	
a. Preventive activities	Section 4.3 / Appendix B
b. Floodplain Management Regulatory/current & future conditions	Section 4.3 / Appendix B

CRS Step	Section/Page
c. Property protection activities	Section 4.3 / Appendix B
d. Natural resource protection activities	Section 4.3 / Appendix B
e. Emergency services activities	Section 4.3 / Appendix B
f. Structural projects	Section 4.3 / Appendix B
g. Public information activities	Section 4.3 / Appendix B
8. Draft an action plan.	
a. Actions must be prioritized	Sections 4.4 – 4.5 / Appendix B
(1) Recommendations for activities from two of the six categories	Sections 4.4 – 4.5 / Appendix B
(2) Recommendations for activities from three of the six categories	Sections 4.4 – 4.5 / Appendix B
(3) Recommendations for activities from four of the six categories	Sections 4.4 – 4.5 / Appendix B
(4) Recommendations for activities from five of the six categories	Sections 4.4 – 4.5 / Appendix B
b. Post-disaster mitigation policies and procedures	Sections 4.4 – 4.5 / Appendix B
c. Action items for mitigation of other hazards	Sections 4.4 – 4.5 / Appendix B
9. Adopt the plan.	Section 5
10. Implement, evaluate and revise.	
a. Procedures to monitor and recommend revisions	Sections 6.1.1 – 6.2.2
b. Same planning committee or successor committee that qualifies under Section 511.a.2 (a) does the evaluation	Section 6.1.1

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1 INTRODUCTION

1.1 Purpose

The purpose of this plan is to identify, assess and mitigate flood risk in order to better protect the people and property of the Town of Cutler Bay from the effects of flood hazards. Information in this plan will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery to communities and their residents by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruptions. The planning area has been affected by hazards in the past and is thus committed to reducing future impacts from hazard events and maintaining eligibility for mitigation-related federal funding.

The Plan was developed in a joint and cooperative venture by members of the Cutler Bay Planning Team to ensure Cutler Bay's continued eligibility for federal disaster assistance including the Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation Program (PDM), and the Flood Mitigation Assistance Program (FMA). Completion of this plan also earns credits for the National Flood Insurance Program's Community Rating System (CRS) which allows for discounted flood insurance premiums for citizens residing within the Town. Furthermore, the Plan has been prepared in compliance with Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act or the Act), 42 U.S.C. 5165, enacted under Section 104 of the Disaster Mitigation Act of 2000, (DMA 2000) Public Law 106-390 of October 30, 2000, as implemented at CFR 201.6 and 201.7 dated October 2007.

1.2 Background and Scope

The Town is a participant in both the National Flood Insurance Program (NFIP) and the CRS Program. As part of the CRS program, the Town is classified as a repetitive loss category "C" community which requires the development of a Floodplain Mitigation Plan. The Town must accurately identify flood hazards, analyze their impacts on people and property, and identify ways to reduce those impacts through hazard mitigation.

As defined by FEMA, "hazard mitigation" means any sustained action taken to reduce or eliminate the long-term risk to life and property for a hazard event. Hazard mitigation planning is the process through which hazards are identified, likely impacts determined, mitigation goals set, and appropriate mitigation strategies determined, prioritized, and implemented. This plan documents Cutler Bay's hazard mitigation planning process and identifies relevant flood hazards and vulnerabilities and strategies the Town will use to decrease vulnerability and increase resiliency and sustainability.

1.3 Community Profile

1.3.1 Overview of the Community

The Town of Cutler Bay, Florida, is located along Biscayne Bay in southern Miami-Dade County. The Town comprises approximately 10 square miles and is home to over 40,000 residents. The Town was incorporated on November 8, 2005, making it the youngest municipality in the State of Florida. The Town was substantially built-out at the time of its incorporation. **Due to its recent incorporation as a municipality, Miami-Dade County remains an extensive source of data and historic information for**

the Town. Cutler Bay is currently an active participant in the Miami-Dade County Local Mitigation Strategy (LMS).

The boundaries of the Town are approximately as follows: on the North by SW 184 Street (Eureka Drive) from the Florida Turnpike to Biscayne Bay; on the West from SW 184 Street following US 1 to SW 112 (Allapattah Road) and then along SW 126 (Hanlin Mills Drive); on the South by SW 216 Avenue and along historic Old Cutler Road, taking a right on SW 224 Street (up to SW 47th Avenue heading south and left of SW 232 Street) going east to Biscayne Bay. The Eastern Border follows the coastline of Biscayne Bay from SW 184 Street to SW 224 Street. The Town of Cutler Bay is shown in Figures 1.1 and 1.2.

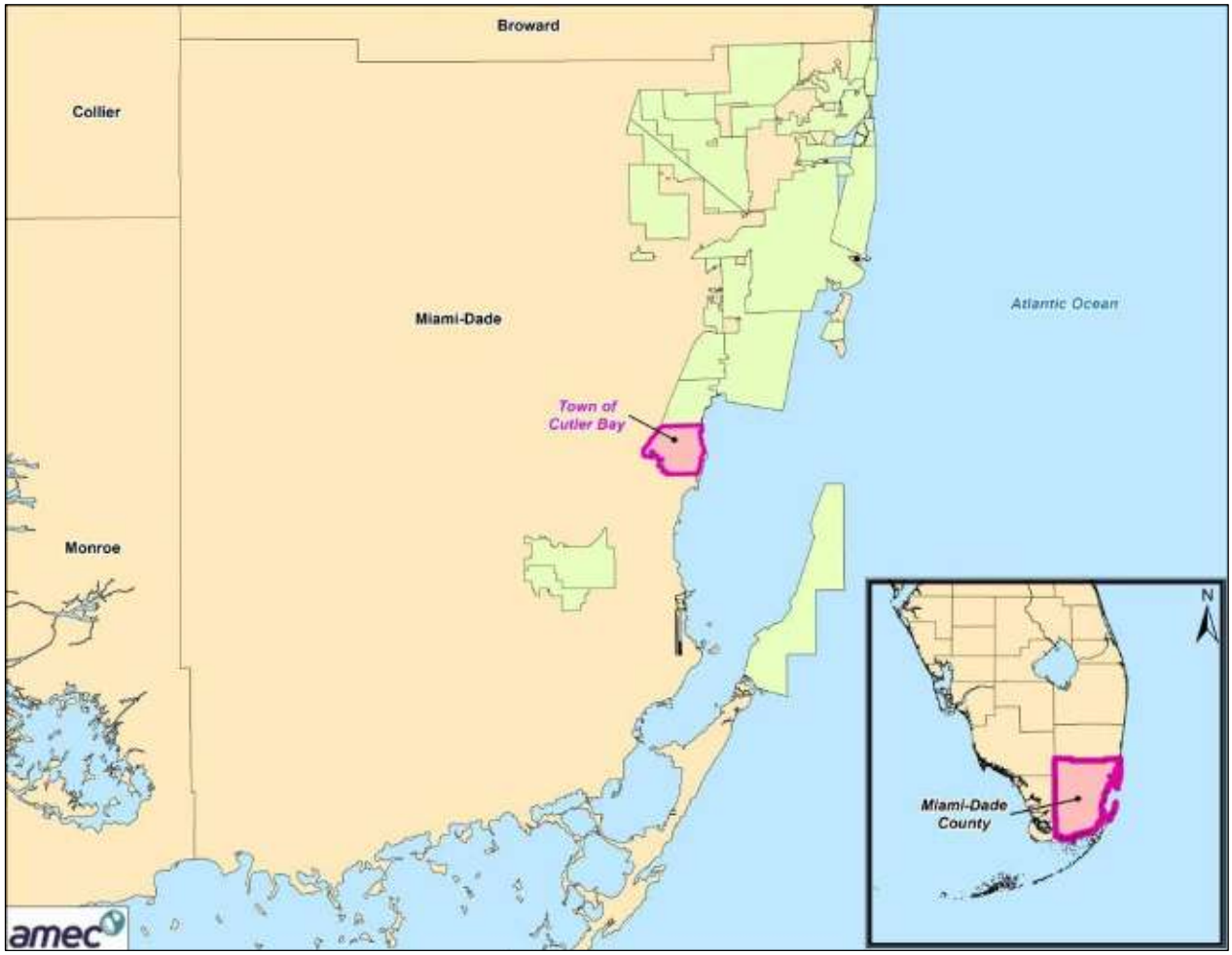

Figure 1.1 - Cutler Bay Location Map

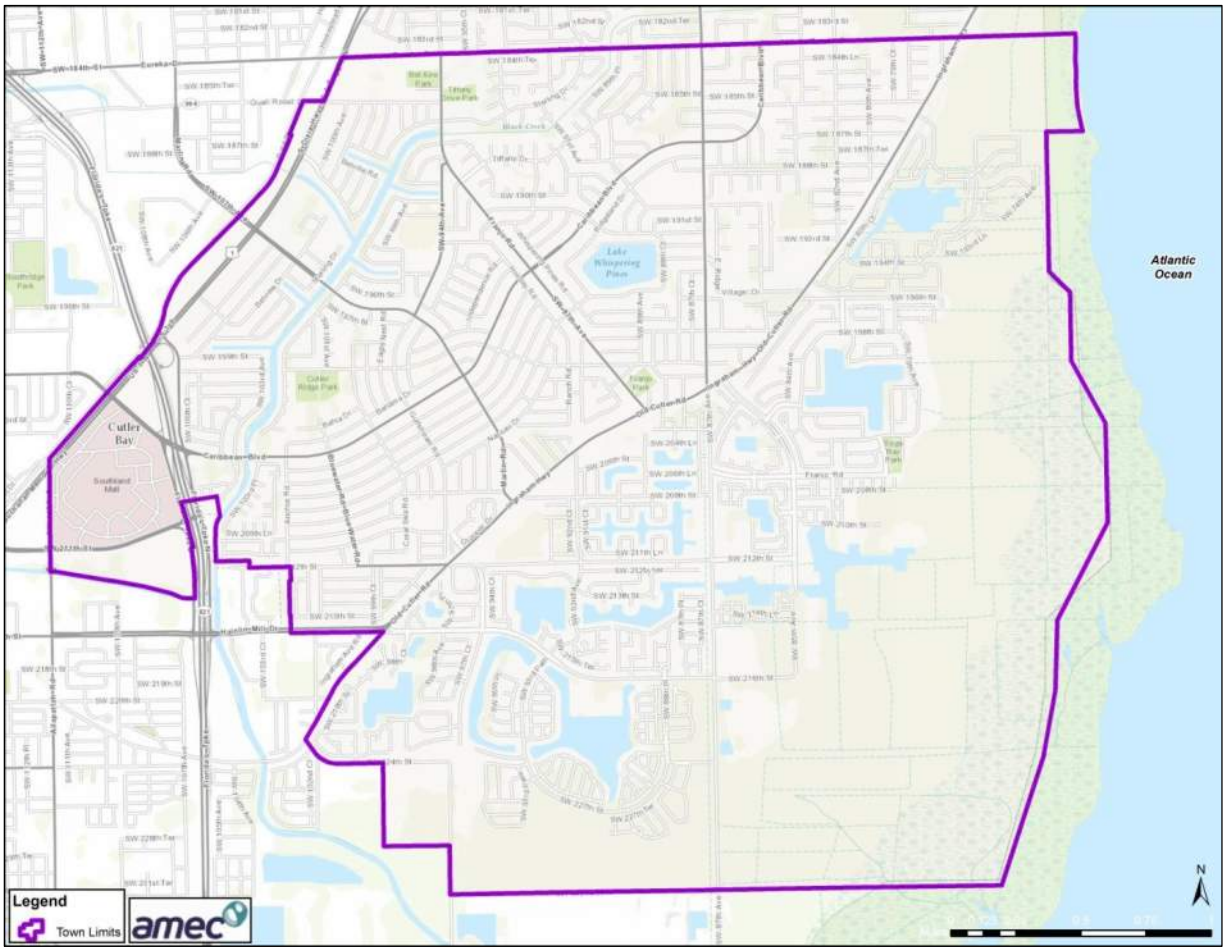

Figure 1.2 – Cutler Bay Base Map

1.3.2 Topography and Climate

Cutler Bay is flat and low with elevations generally below 10 feet National Geodetic Vertical Datum of 1929 (NGVD). The Town is traversed by a canal system that directs drainage into Biscayne Bay and the Atlantic Ocean. The topography of the Town can be seen in Figure 1.3.

The climate is subtropical marine, characterized by a long, warm summer with abundant rainfall followed by a mild, dry winter. The wet season begins in May, ending in mid-October. The average annual temperature is 76 degrees Fahrenheit. The average annual precipitation for Cutler Bay is 59 inches.

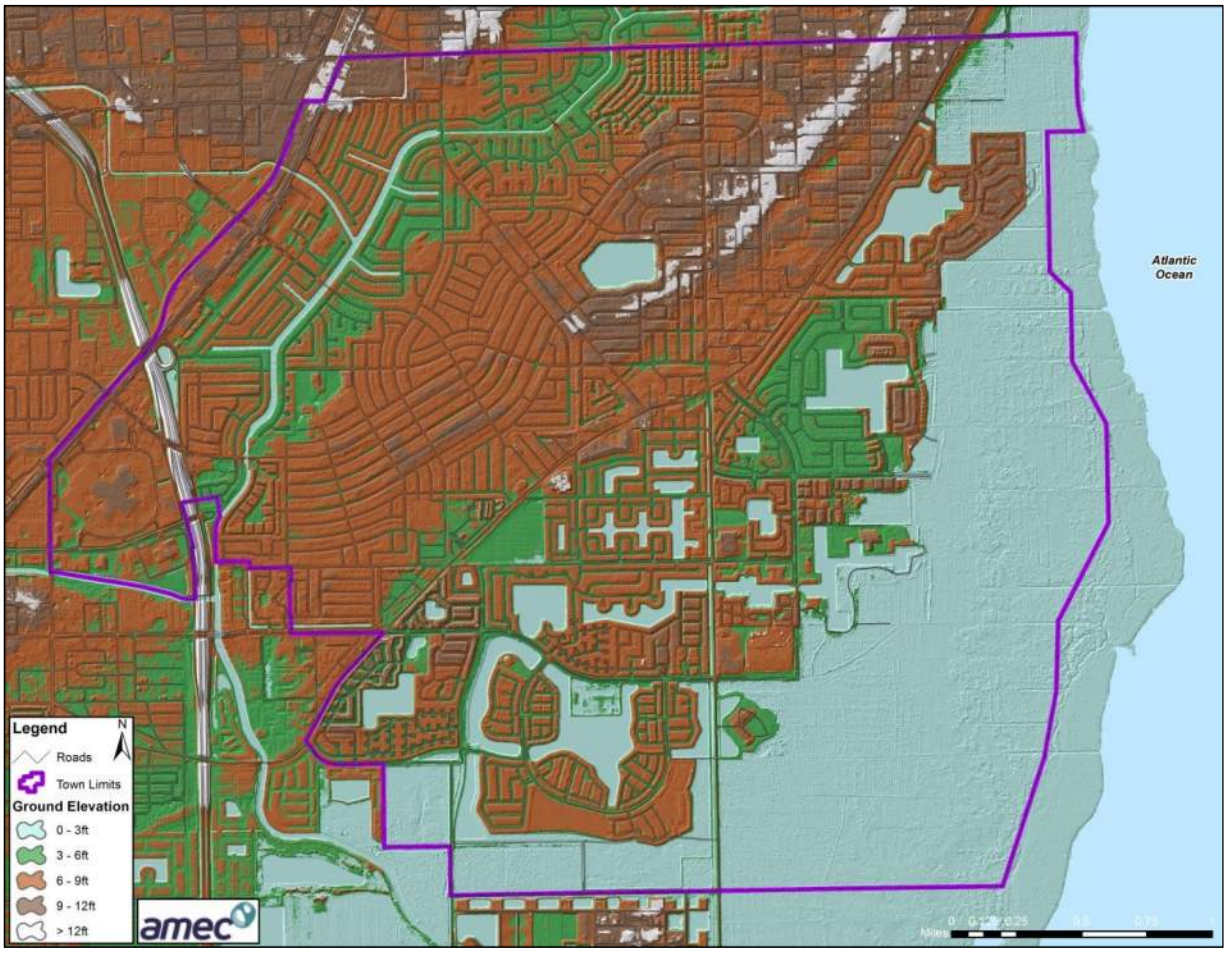

Figure 1.3 - Cutler Bay Topography

1.3.3 History

Cutler Ridge's history began in the 1870's when William C. Cutler visited the area and fell in love with it. Dr. William C. Cutler was the leading practitioner of medicine and surgery in Chelsea, Massachusetts.

Native Americans living in South Florida then referred to the area as the Big Hunting Grounds. It was officially part of the Perrine Grant awarded to Dr. Henry Perrine, in 1838. Dr. Cutler bought a 600-acre tract of this land for $1.25 per acre and wanted to establish a fruit and vegetable plantation.

The only one of Dr. Cutler's friends who became a permanent resident was William Fuzzard. On his first trip to the area in 1882, twenty-year-old William stayed in Coconut Grove while he explored the area. He returned in 1883, setting up a tent before building a wooden two-story home. One of Mr. Fuzzard's greatest contributions to the Cutler area was the path he cut through the wilderness. The road, which was eventually widened to a wagon trail, went from Coconut Grove to his home. This trail was the beginning of what is now called Old Cutler Road. It ran north from Fuzzard's home, went east and joined what is now Coral Reef Drive; Fuzzard's path was declared a public road in 1895. What was once the path traveled by Fuzzard's white mule, Samson, became the beginning of what is now the State Historic Highway of Old Cutler Road. The present Cutler Road, which follows a somewhat altered course, was declared a State Historic Highway in May, 1974, by the Florida Legislature.

It was really not until Mr. David Blumberg began developing the land that Cutler Ridge became an organized community. In the early 1950's Blumberg and his partner, Joe Segal, convinced owner Walter Blumberg to sell him 1,400 acres of undeveloped land. Blumberg actually named the area after Dr. Cutler and the limestone ridge on which the land sits. The first housing development went up in 1954, and the Cutler Ridge Mall opened in 1960. Street names in Cutler Ridge came from holidays and the ports of call Mr. Blumberg visited as a sailor. The area around the mall was called Seminole Plains. What is now Lakes by the Bay was called Lincoln City as the streets and parks were laid out. Black Point was the first post office south of Cutler, opening on February 15, 1904.

More About the Stories Behind the Area and its Names

In the winter of 1904-05, Wilford B. Focht arrived in Cutler and stayed at the Richmond Inn. He was a cousin of Mr. John H. Earhart, who owned 2,000 acres, which included a small farming community called Franjo, after John Earhart and his brother, Francis. Franjo Road (SW 97 Avenue) gets its name from this community.

1.3.4 Economy

According to the U.S. Census Bureau, the median household income for Cutler Bay from 2008-2012 was $63,681. 11.3% of the population is considered to be living below the poverty level. Table 1.1 shows employment and unemployment rates along with industry employment by major classification for the Town. The economy in Cutler Bay is focused primarily on educational services, health care, and social assistance which makes up 25% of the local economy. That is followed closely by waste management services (13.4%) and retail services (12.3%). Much of the population in Miami-Dade County, as well as, Cutler Bay, commute from their place of residence to another nearby community or to another county. As a result many businesses in Cutler Bay employ workers from outside of the Town. Based on 2009 estimates, the number of owner-occupied housing units in Cutler Bay in the price range of $200,000 to $299,999 totaled 2,453 and the number of owner-occupied units in the price range of $300,000 to $399,999 totaled 2,609. As a result, 5,062 owner-occupied units out of a total of 13,338 were in a price range between $200,000 and $399,999. Since the Town of Cutler Bay is primarily a residential community, much of the tax base comes from residential structures. Major employers for Cutler Bay are listed in Table 1.2.

Table 1.1 - Employment and Occupation Statistics for Cutler Bay

Employment Status	**Percentage**
Employed	60.3
Unemployed	5.7
Not in Labor Force	34.0
Occupation	
Management, business, science and arts	38.5
Service	16.0
Sales and office	30.5
Natural resources, construction and maintenance	9.5
Production, transportation and material moving	5.5

Source: U.S. Census Bureau, 2008-2012 American Community Survey 5-Year Estimates

Table 1.2 - Major Employers in Cutler Bay, FL

Corporation/Organization	**Service/Product by SIC Code**	**# of Employees**
Alorica, Inc.	Telemarketing	919
Healthsouth Rehabilitation Hospital of Miami	Medical Services	180
Mercedes Benz	Car Dealership	140

Corporation/Organization	Service/Product by SIC Code	# of Employees
Eastridge Retirement Village, Inc.	Retirement Hotel	225
Southland Mall	Shopping Center	500

Source: Town of Cutler Bay

1.3.5 Population

The Town of Cutler Bay has an estimated 42,221 residents, according to the U.S. Census Bureau 2012 estimates. Table 1.3 provides detail for Cutler Bay's demographics.

Table 1.3 - Cutler Bay Demographic and Social Characteristics, 2010

Demographic	Percentage
Gender/Age	
Male	48.0
Female	52.0
Median Age	35.5
Under 5 Years	7.4
65 Years and Over	11.8
Race/Ethnicity	
White	77.3
Asian	2.3
Black or African American	14.2
American Indian/Alaska Native	0.2
Hispanic or Latino	54.5[1]
Education	
High School Graduate or Higher	87.7
Bachelor's Degree or Higher	30.7

Source: U.S. Census Bureau, 2010, www.census.gov

[1]Hispanics may be of any race, so also are included in applicable race categories.

1.4 Plan Organization

The Cutler Bay Floodplain Mitigation Plan is organized as follows:

- Section 2: Planning Process
- Section 3: Flood Risk Assessment
- Section 4: Mitigation Strategy
- Section 5: Plan Adoption
- Section 6: Plan Implementation and Maintenance
- Appendix A: Planning Process
- Appendix B: Mitigation Strategy
- Appendix C: References

2 PLANNING PROCESS

Requirement §201.6(b): 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;
2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process; and
3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.
Requirement §201.6(c)(1): The plan shall include the following:
1) Documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

This Floodplain Mitigation Plan was developed under the guidance of a Floodplain Mitigation Planning Committee (FMPC). The Committee's representatives included representatives of Cutler Bay Departments, citizens and other stakeholders.

This plan identifies activities that can be undertaken by both the public and the private sectors to reduce safety hazards, health hazards, and property damage caused by floods. The Plan fulfills the requirements of Section 104 of the Disaster Mitigation Act of 2000, qualifies for CRS credit, and most importantly provides Cutler Bay with effective actions for reducing flood hazard impacts on people and property.

2.1 Local Government Participation

The DMA planning regulations and guidance stress that each local government seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

- Participate in the process as part of the FMPC;
- Detail where within the planning area the risk differs from that facing the entire area;
- Identify potential mitigation actions; and
- Formally adopt the plan.

For the Cutler Bay FMPC, "participation" meant the following:

- Providing facilities for meetings;
- Attending and participating in the FMPC meetings;
- Completing and returning the AMEC Data Collection Guide;
- Collecting and providing other requested data (as available);
- Managing administrative details;
- Making decisions on plan process and content;
- Identifying mitigation actions for the plan;

- Reviewing and providing comments on plan drafts;
- Informing the public, local officials, and other interested parties about the planning process and providing opportunity for them to comment on the plan;
- Coordinating, and participating in the public input process; and
- Coordinating the formal adoption of the plan by the governing board of the Town.

The Town met all of these participation requirements. Key representatives from the Town of Cutler Bay included the Town Manager, Department of Community Development, Public Works Department and the GIS consultant. The FMPC also included representatives from the insurance and real estate industries as well as Town residents. The participants comprising the Cutler Bay FMPC included the following:

1. Rafael Casals – Cutler Bay Town Manager
2. Sandra Cuervo, CFM – Cutler Bay Department of Community Development*
3. Alfredo Quintero – Cutler Bay Public Works Department
4. Yenier Vega – Cutler Bay Public Works Department
5. Mary Ann Mixon – Council Liaison to the FMPC
6. Janice Rowton – Cutler Bay Resident and Insurance Industry Representative (State Farm)
7. Luis Badillo – Cutler Bay Resident and Real Estate Industry Representative (Keller Williams)
8. Jorge Acevedo, P.E. – Cutler Bay Resident
9. Dan Vesce – Cutler Bay Resident
10. Paul Mauriello, AICP – Cutler Bay Resident

***Note: Department of Community Development is the office responsible for community planning.**

The Town representatives participating in the FMPC and guiding the development of this plan are experienced in the following areas of expertise as related to the CRS mitigation categories as detailed in Table 2.1.

Table 2.1 - Cutler Bay Staff Capability with Six Mitigation Categories

Community Department	Prevention	Property Protection	Natural Resource Protection	Emergency Services	Structural Flood Control Projects	Public Information	Other
Town Management	X	X	X	X		X	X
Community Development	X	X	X			X	X
Public Works	X	X	X	X	X	X	X

This Section 2 and Appendix A provide additional information and documentation of the planning process that was implemented for the development of this FMP.

2.2 The 10-Step Planning Process

The planning process for preparing the Cutler Bay Floodplain Mitigation Plan was based on DMA planning requirements and FEMA's associated guidance. This guidance is structured around a four-phase process:

1) Planning Process;
2) Risk Assessment;
3) Mitigation Strategy; and
4) Plan Maintenance.

Into this process, Cutler Bay integrated a more detailed 10-step planning process used for FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. Thus, the modified 10-step process used for this plan meets the requirements of six major programs: FEMA's Hazard Mitigation Grant Program; Pre-Disaster Mitigation Program; Community Rating System; Flood Mitigation Assistance Program; Severe Repetitive Loss Program; and new flood control projects authorized by the U.S. Army Corps of Engineers.

Table 2.2 shows how the 10-step CRS planning process aligns with the four phases of hazard mitigation planning pursuant to the Disaster Mitigation Act of 2000.

Table 2.2 - Mitigation Planning and CRS 10-Step Process Reference Table

DMA Process	CRS Process
Phase I – Planning Process	
§201.6(c)(1)	Step 1. Organize to Prepare the Plan
§201.6(b)(1)	Step 2. Involve the Public
§201.6(b)(2) & (3)	Step 3. Coordinate
Phase II – Risk Assessment	
§201.6(c)(2)(i)	Step 4. Assess the Hazard
§201.6(c)(2)(ii) & (iii)	Step 5. Assess the Problem
Phase III – Mitigation Strategy	
§201.6(c)(3)(i)	Step 6. Set Goals
§201.6(c)(3)(ii)	Step 7. Review Possible Activities
§201.6(c)(3)(iii)	Step 8. Draft an Action Plan
Phase IV – Plan Maintenance	
§201.6(c)(5)	Step 9. Adopt the Plan
§201.6(c)(4)	Step 10. Implement, Evaluate and Revise the Plan

The development of this FMP involved a comprehensive review of all flood hazards specific to the Town of Cutler Bay. Also to be noted, this plan provides an analysis of climate change impacts to the Town.

2.2.1 Phase I – Planning Process

Planning Step 1: Organize to Prepare the Plan

With Cutler Bay's commitment to participate in the DMA planning process and the Community Rating System (CRS), Town officials worked to establish the framework and organization for development of the plan. An initial meeting was held with key community representatives to discuss the organizational aspects of the plan development process. At the beginning of this planning process, the Town of Cutler Bay passed a resolution establishing the planning process and the FMPC. This resolution is included in Appendix A.

The initial kick-off meeting was held on October 24, 2013. Invitations to this kickoff meeting were extended to Town officials, citizens, and federal, state, and local stakeholders that might have an interest in participating in the planning process. The list of initial invitees is included in Appendix A. A notice was also posted in two local newspapers inviting members of the public to attend this kickoff meeting.

The FMPC was comprised of representatives from key Town Departments, key stakeholders and the public. The following were invited to participate on the FMPC:

Town of Cutler Bay
Mayor's Office
Town Manager's Office
Police Department
Department of Community Development (Planning and Zoning and Building)
Public Works
Parks and Recreation
Council Liaison to the FMPC

Neighboring Communities
Miami-Dade County
City of Coral Gables
City of Homestead
City of Miami
Village of Palmetto Bay
Village of Pinecrest

Other Government and Stakeholder Representatives
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

A list of participating FMPC representatives is included in Section 2.1. This list details all FMPC members that attended one or more FMPC meetings detailed in Table 2.3. Note that the above list of FMPC members also includes citizens and other stakeholder representatives that contributed to the planning process.

Based on the area of expertise of each FMPC member, Table 2.1 demonstrates each member's expertise in the six mitigation categories (Prevention, Property Protection, Natural Resource Protection, Emergency Services, Structural Flood Control Projects and Public Information). The Town of Cutler Bay

Department of Community Development which is responsible for community land use and comprehensive planning was an active participant on the FMPC and provided data and information to support development of the plan.

The planning process officially began with a kick-off meeting held on October 24, 2013 at 5:30 pm in the Town Council Chambers, followed by a public kick-off meeting held the same day at 6:30 pm at the Town Hall. The meetings covered the scope of work and an introduction to the DMA, CRS, and FMA requirements. The final piece of the presentation dealt with the NFIP and the Biggert-Waters 2012 National Flood Insurance Reform Act (BW-12).

During the planning process, the FMPC communicated through face-to-face meetings, email, telephone conversations, and a file transfer protocol (ftp) website. Draft documents were posted on the Town's website so that the FMPC members could easily access and review them. Agendas and sign in sheets for FMPC meetings are included in Appendix A. The formal meetings held and topics discussed are detailed in Table 2.3. All FMPC meetings covered the CRS Planning Steps and were open to the public.

Table 2.3 - FMPC Meetings

Meeting Type	Meeting Topic	Meeting Date	Meeting Location
FMPC #1 (Kick-off)	1) Introduction to DMA, CRS and the planning process 2) Organize resources: the role of the FMPC, planning for public involvement, and coordinating with other agencies and stakeholders 3) Introduction to hazard identification	October 24, 2013	Town Council Chambers
FMPC #2	1) Program overview/history of project 2) Discussion of Florida Sunshine Law 3) Discussion of the FMPC 's functions and responsibilities 4) Development of flood mitigation plan (four phases of DMA) 5) Overview of Program for Public Information (PPI) 6) Project schedule	December 11, 2013	Town Center Community Room
FMPC #3	1) Local flooding concerns 2) Flood protection and flood safety publications and outreach materials 3) Coordination with other plans, ordinances and studies 4) Public information needs 5) Coordination letter for other agencies and stakeholders and the distribution list for letter	January 16, 2014	Town Center Community Room
FMPC #4	1) Review of public survey results 2) Documentation of coordination with other agencies 3) Identification of local flooding areas 4) Additional assessment of public information needs	February 20, 2014	Town Center Community Room

Meeting Type	Meeting Topic	Meeting Date	Meeting Location
	5) Target audiences and stakeholders for PPI		
FMPC #5	1) Discussion of Flood Risk Assessment (Assess the Hazard) 2) Discussion of Vulnerability Assessment (Assess the Problem) 3) Preliminary results from the PPI	April 22, 2014	Town Center Community Room
FMPC #6	1) Development of Goals for FMP 2) Development of Mitigation Strategies for FMP	July 17, 2014	Town Center Community Room
FMPC #7	1) Review "Draft" Floodplain Mitigation Plan 2) Solicit comments and feedback from the FMPC	September 25, 2014	Town Council Chambers

Planning Step 2: Involve the Public

Early discussions with Cutler Bay personnel established the initial plan for public involvement. Public outreach for the plan development began during the initial plan development process with an informational press release placed in the local paper inviting the public to the early public meeting held on October 24, 2013 as shown in Appendix A. As part of the early outreach efforts, the public was also invited to attend the kickoff meeting. At the kick-off meeting, the FMPC discussed additional options for public involvement and agreed to an approach using established public information mechanisms and resources within the community.

Public involvement activities for this plan update included press releases, stakeholder and public meetings, public surveys, and the collection of public and stakeholder comments on the draft plan through a variety of mechanisms as further described below. The formal public meetings for this project are summarized in Table 2.4.

Table 2.4 - Public Meetings

Meeting Type	Meeting Topic	Meeting Date	Meeting Locations
Public Meeting #1	1) Introduction to DMA, CRS and the planning process 2) Overview of BW-12 and NFIP	October 24, 2013	Town Council Chambers
Public Meeting #2	1) Overview of purpose of risk assessment 2) Presentation of risk assessment 3) Presentation of vulnerability assessment	April 23, 2014	Cutler Ridge Park
Public Meeting #3	1) Review "Draft" Floodplain Mitigation Plan 2) Solicit comments and feedback from the public	September 25, 2014	Town Council Chambers
Public Meeting # 4	1) Review "Draft" Floodplain Mitigation Plan 2) Solicit comments and feedback from the public	October 1, 2014	Town Council Chambers

The complete draft of the plan was provided to the FMPC in September 2014. A preliminary public meeting was conducted on September 25th and a final public meeting was held on October 1, 2014. The public meeting was advertised in the local newspaper, indicating where the plan could be accessed on the Town website. Documentation to support the final public meeting can be found in Appendix A

Involving the Public Beyond Attending Public Meetings

Beyond the formal public meetings, the plan development process included additional public outreach activities as show below in Table 2.5. The Town of Cutler Bay found 10 different ways to involve the public beyond attending public meetings.

Table 2.5 - Public Outreach Efforts

Project/Event	Message	Frequency	Other Ways to Involve the Public/CRS Step 2
Project Kick-off – Public Meeting	Presentation, Informational Brochures and Flyers	One-time	N/A
Flood Mitigation Meeting	Presentation, Informational Brochures and Flyers	One-time	N/A
Miami Herald	Article and meeting announcement	One-time	N/A
South Dade News Leader	Article on 1st Public Meeting	One-time	Yes
Cutler Bay News	Committee Meeting Announcement	One-time	N/A
Movie Night	Public Service Announcement	One-time	N/A
Caribbean Blvd Holiday – Work Zone Open	Presentation, Informational Brochures and Flyers	One-time	N/A
Chili Cook-Off	Surveys and Information Materials on Floodplain Mitigation Plan	One-time	Yes
Roadway Resurfacing Phase III + Flood Flyers	Presentation, Informational Brochures and Flyers	One-time	N/A
Tree Trimming & Canopy Uplifting Project – Bel Aire Section 9 & 10	Informational Brochures and Flyers	One-time	N/A
Tree Trimming & Canopy Uplifting Project – Bel Aire Section 1	Informational Brochures and Flyers	One-time	N/A
Councilmember Loyzelle's Newsletter	Meeting Announcement	One-time	N/A
Concerned Citizen's Meeting (2/4/14)	Presentation, Informational Brochures and Flyers	One-time	N/A
Sidewalk Repairs	Presentation, Informational Brochures and Flyers	One-time	N/A
Alina-School	Presentation, Informational Brochures and Flyers	One-time	N/A
Taste of the Bay	Surveys and Informational Materials on Floodplain Mitigation Plan	One-time	Yes
Old Cutler Glenn HOA Meeting	Presentation, Informational Brochures, Flyers, and information	One-time	Yes
Movie Night at the Park	PSA, Informational Materials and Surveys	One-time	N/A
Relay for Life	Charity Event, Outreach	One-time	N/A
Marlin MOT	Informational Brochures and Flyers	One-time	N/A
Concerned Citizens Meeting (3/4/14)	Presentation, Surveys and Informational Materials on	One-time	Yes

Project/Event	Message	Frequency	Other Ways to Involve the Public/CRS Step 2
	Floodplain Mitigation Plan		
OCR Grand Re-Opening	Presentation, Surveys and Informational Materials	One-time	N/A
Make Mitigation Happen – Repetitive Loss Properties	Surveys and Informational Materials	One-time	N/A
CBBA Luncheon	Informational Materials and Surveys	One-time	N/A
CBBA Meeting	Presentation, Surveys and Informational Materials	One-time	N/A
Seagrape HOA Meeting	Information Materials	One-time	N/A
Concerned Citizens Meeting (4/1/14)	Presentation, Informational Brochures and Flyers	One-time	Yes
Flood Surveys for Repetitive Loss Properties	Informational Brochures and Flyers	One-time	N/A
Enclave Fair at Enclave Club House	Informational Materials and Surveys on Floodplain Mitigation Plan	One-time	Yes
Centennial (Chanterelle) HOA Meeting	Information Materials	One-time	N/A
CBBA/EDC Luncheon	Informational Materials and Surveys	One-time	N/A
Cutler Bay Press Release	Announcing April 2014 Committee and Public Meeting	One-time	N/A
MOT Work Zone 2 Detour	Informational Brochure and Flyers	One-time	N/A
South Dade News Leader	Meeting Announcement	One-time	N/A
Miami Herald Neighbors Section	Meeting Announcement	One-time	N/A
Flood Mitigation Meeting	Presentation, Surveys and Informational Materials	One-time	N/A
Cutler Bay Website	Survey	Continuous/4 months	Yes
Councilmember Mixon	Meeting Announcement at Council Meetings	Monthly	N/A
Cutler Bay Website	Meeting Announcement	Monthly	N/A
Cutler Bay Announcement Board	Meeting Announcement	Monthly	N/A
Risk Assessment for the Floodplain Mitigation Plan	Posted on Website for Review	One-time	Yes
Draft Floodplain Mitigation Plan	Posted on Website for Review	One-time	Yes

Furthermore, the Town of Cutler Bay distributed a public survey (Figure 2.1) requesting public input into the flood mitigation plan planning process and the identification of mitigation activities that could lessen the risk and impact of future flood hazard events. The survey was provided on the Town website as well as distributed at community events. A summary of the completed survey results has been included in Appendix A.

PUBLIC SURVEY FOR
FLOOD MITIGATION PLANNING

Cutler Bay needs your help!

The Town of Cutler Bay is working to become less vulnerable to flooding and your participation is important to us!

The Town received a Flood Mitigation Assistance federal grant to prepare a *Flood Mitigation Plan*. This Plan will identify and assess our community's flood hazard risks and determine how to best minimize or manage those risks and what outreach materials may be necessary to better communicate those risks.

This survey is an opportunity for you to share your opinions and participate in the mitigation planning process. The information you provide will help us better understand your hazard concerns and can lead to mitigation activities that should help lessen the impacts of future hazard events.

Please help us by completing this survey by March 30, 2014 and returning it to:

Sandra Cuervo, CFM
Town of Cutler Bay – Community Development Department
10720 Caribbean Boulevard, Suite 105
Cutler Bay, FL 33189

Surveys can also be faxed to: (305) 234-4251 or emailed to scuervo@cutlerbay-fl.gov

1. **Where do you live?**
   - ❑ Cutler Bay
   - ❑ Other: _____
2. **Have you ever experienced or been impacted by high water or flooding in Cutler Bay?**
   - ❑ Yes
   - ❑ No
   - a. **If "Yes," please explain:**

     _____

     _____

     _____

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Figure 2.1- Public Survey

Cutler Bay Academy high school students assisted the Town at the "5th Annual Chili Day" in January 2014 by volunteering at the flood hazard information both and distributing flood mitigation public surveys to event attendees. The Survey was also available at public meetings, homeowner association meetings, and other special events. The survey was available in both English and Spanish as a significant number of residents primarily speak Spanish.

Flood Hazard Information Booth provided by the Town of Cutler Bay at Chili Day 2014

Public Survey for Flood Mitigation Planning at Chili Day 2014

Planning Step 3: Coordinate

Early in the planning process, the FMPC determined that the risk assessment, mitigation strategy development, and plan approval would be greatly enhanced by inviting other local, state and federal agencies and organizations to participate in the process. Representatives from the following agencies were invited to participate on the FMPC:

- 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

Coordination involved contacting these agencies through a variety of mechanisms and informing them on how to participate in the plan development process. Coordination with these groups included, holding face-to-face meetings, sending outreach letters, some with follow up phone calls; and making phone calls alone to out of area agencies. All of these groups and agencies were solicited asking for their assistance and input and telling them how to become involved in the plan development process. A copy of each coordination letter can be found in Appendix A.

Coordination with Other Community Planning Efforts and Hazard Mitigation Activities

Coordination with other community planning efforts is also paramount to the success of this plan. Mitigation planning involves identifying existing policies, tools, and actions that will reduce a community's risk and vulnerability to hazards. Cutler Bay uses a variety of comprehensive planning mechanisms, such as Growth Management Plan, land development regulations and ordinances, to guide growth and development. Integrating existing planning efforts and mitigation policies and action strategies into this plan establishes a credible and comprehensive plan that ties into and supports other community programs. The development of this plan incorporated information from the following existing plans, studies, reports, and initiatives as well as other relevant data from neighboring communities and other jurisdictions.

- Miami-Dade County Local Mitigation Strategy, 2013
- Cutler Bay Repetitive Loss Areas Analysis, 2012
- Cutler Bay Stormwater Master Plan, 2008
- Cutler Bay Growth Management Plan, 2008

- Cutler Bay Capital Improvement Plan, 2013
- Miami-Dade County Flood Insurance Study, 2009
- Cutler Bay Flood Damage Prevention Ordinance
- Cutler Bay Land Development Regulations (2012)
- Cutler Bay Building Code Ordinance
- Cutler Bay Basin or Sub-basin flood studies
- Cutler Bay Community Rating System Annual Reports
- Building Code Ordinance
- State of Florida Hazard Mitigation Plan, August 2013
- State of Florida Critical Erosion Report, June 2012
- Miami-Dade Sea Level Rise Task Force Report and Recommendations, July 2014

These and other documents were reviewed and considered, as appropriate, during the collection of data to support Planning Steps 4 and 5, which include the hazard identification, vulnerability assessment, and capability assessment. Data from these plans and ordinances were incorporated into the risk assessment and hazard vulnerability sections of the plan. The source document is referenced where the data from the existing studies and reports is used in this plan. The data was also used in determining the capability of the community in being able to implement certain mitigation strategies. The Capability Assessment can be found in Section 3.4.

2.2.2 Phase II – Risk Assessment

Planning Steps 4 and 5: Identify/Assess the Hazard and Assess the Problem

The FMPC completed a comprehensive effort to identify, document, and profile all flood hazards that have, or could have, an impact on the planning area including an evaluation of climate change and sea level rise. Data collection worksheets were developed and used in this effort to aid in determining hazards and vulnerabilities and where the risk varies across the planning area. Geographic information systems (GIS) were used to display, analyze, and quantify hazards and vulnerabilities.

The FMPC also conducted a capability assessment to review and document the planning area's current capabilities to mitigate risk from and vulnerability to hazards. By collecting information about existing government programs, policies, regulations, ordinances, and emergency plans, the FMPC could assess those activities and measures already in place that contribute to mitigating some of the risks and vulnerabilities identified. A more detailed description of the risk assessment process and the results are included in Section 3 Risk Assessment.

2.2.3 Phase III – Mitigation Strategy

Planning Steps 6 and 7: Set Goals and Review Possible Activities

AMEC facilitated brainstorming and discussion sessions with the FMPC that described the purpose and process of developing planning goals and objectives, a comprehensive range of mitigation alternatives, and a method of selecting and defending recommended mitigation actions using a series of selection criteria. This information is included in Section 4 Mitigation Strategy. Additional documentation on the process the FMPC used to develop the goals and strategy has been included in Appendix B.

Planning Step 8: Draft an Action Plan

A complete first draft of the plan was prepared based on input from the FMPC regarding the draft risk assessment and the goals and activities identified in Planning Steps 6 and 7. This complete draft was

posted for FMPC review and comment on the Town's website. Other agencies were invited to comment on this draft as well. FMPC and agency comments were integrated into the second public review draft, which was advertised and distributed to collect public input and comments. AMEC integrated comments and issues from the public, as appropriate, along with additional internal review comments and produced a final draft for the FDEM and FEMA Region IV to review and approve, contingent upon final adoption by the Town of Cutler Bay.

2.2.4 Phase IV – Plan Maintenance

Planning Step 9: Adopt the Plan

In order to secure buy-in and officially implement the plan, the plan was reviewed and adopted by the Town Council on the date(s) included in the corresponding resolution in Section 5 Plan Adoption.

Planning Step 10: Implement, Evaluate and Revise the Plan

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning. This is Planning Step 10 of the 10-step planning process. Up to this point in the planning process, all of the FMPC's efforts have been directed at researching data, coordinating input from participating entities, and developing appropriate mitigation actions. Each recommended action includes key descriptors, such as a lead manager and possible funding sources, to help initiate implementation. Section 6 Plan Implementation and Maintenance provides an overview of the overall strategy for plan implementation and maintenance and outlines the method and schedule for monitoring, updating, and evaluating the plan. The Section also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

3 FLOOD RISK ASSESSMENT

Requirement §201.6(c)(2): [The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

This section describes the Risk Assessment process for the development of the Town of Cutler Bay Floodplain Mitigation Plan. It describes how the Town met the following requirements from the 10-step planning process:

- Planning Step 4: Assess the Hazard
- Planning Step 5: Assess the Problem

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

This flood risk assessment covers the entire geographical area of the Town of Cutler Bay. The risk assessment identifies and profiles the relevant flood hazards for Cutler Bay and assesses the exposure of lives, property, and infrastructure to these hazards. This process allows for a better understanding of Cutler Bay's potential risk to flood hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events. This risk assessment process followed the methodology described in the FEMA publication Understanding Your Risks—Identifying Hazards and Estimating Losses (FEMA 386-2, 2002), which breaks the assessment down to a four-step process:

1) Identify Hazards;

2) Profile Hazard Events;

3) Inventory Assets; and

4) Estimate Losses.

Data collected through this process has been incorporated into the following subsections of this chapter:

Section 3.1: **Hazard Identification** identifies the natural flood hazards that threaten the Cutler Bay planning area.

Section 3.2: **Hazard Profiles** discusses the threat to the Cutler Bay planning area and describes previous occurrences of flood hazard events and the likelihood of future occurrences.

Section 3.3: Vulnerability Assessment assesses the Cutler Bay planning area's exposure to natural flood hazards; considering assets at risk, critical facilities, and future development trends.

Section 3.4: Capability Assessment inventories existing mitigation activities and policies, regulations, and plans that pertain to mitigation and can affect net vulnerability.

3.1 Hazard Identification

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type…of all natural hazards that can affect the jurisdiction.

The Town of Cutler Bay's FMPC conducted a hazard identification study to determine the natural flood hazards that threaten the planning area.

3.1.1 Results and Methodology

Using existing flood hazard data and input gained through planning meetings, the FMPC agreed upon a list of natural flood hazards that could affect the Town of Cutler Bay. Flood hazard data from the Miami-Dade County Local Mitigation Strategy (LMS), FEMA, the Florida Division of Emergency Management (FDEM), the National Oceanic and Atmospheric Administration (NOAA), the National Hurricane Center (NHC), National Climatic Data Center (NCDC), the Spatial Hazards Events and Losses Database for the United States (SHELDUS™) and many other sources were examined to assess the significance of these hazards to the Cutler Bay planning area. Significance was measured in general terms and focused on key criteria such as frequency and resulting damage, which includes deaths and injuries, as well as property and economic damage.

The flood hazards identified in Table 3.1 were evaluated as part of this plan. Only the more significant hazards with the potential to cause significant human and/or monetary losses in the future have a more detailed hazard profile and are analyzed further in Section 3.3 Vulnerability Assessment.

Table 3.1- Flood Hazard Summary

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Climate Change and Sea Level Rise	Occasional	Limited	Limited	Low
Coastal/Canal Bank Erosion	Likely	Limited	Limited	Low
Dam/Levee Failure	Unlikely	Limited	Negligible	Low
Flood: 100-/500-year	Likely	Extensive	Catastrophic	High
Flood: Stormwater/Localized Flooding	Highly Likely	Significant	Limited	Medium
Hurricane and Tropical Storms (including Storm Surge)	Likely	Extensive	Catastrophic	High

Guidelines:
Frequency of Occurrence:
Highly Likely: Nearly 100% probability within the next year.
Likely: Between 10 and 100% probability within the next year.
Occasional: Between 1 and 10% probability within the next year.
Unlikely: Less than 1% probability within the next year.

Potential Magnitude:
Catastrophic: More than 50% of the area affected.
Critical: 25 to 50% of the area affected.
Limited: 10 to 25% of the area affected.
Negligible: Less than 10% of the area affected.

Spatial Extent:
Limited: Less than 10% of planning area.
Significant: 10-50% of planning area.
Extensive: 50-100% of planning area.

Significance:
Low
Medium
High

Source: AMEC Data Collection Guide

The following hazard was evaluated by the FMPC and determined to be a non-prevalent hazard that should not be included in the plan. Following is a brief description of the hazard and the reason for its exclusion:

- **Tsunamis** - Defined as a long-term (generally 15 to 60 minutes) wave caused by a large scale movement of the sea floor due to volcanic eruption, marine earthquake or landslide. Barely noticeable at sea, the wave velocity may be as high as 400 knots so that it travels great distances and in shoal water reaches heights up to 15 meters. NOAA indicates that the risk of a tsunami in the Cutler Bay planning area is relatively low due to the absence of subduction zones at the edges of plate boundaries to spawn such waves except small subduction zones under the Caribbean and Scotia arcs. Based on historical data, 12% of the world's tsunamis have occurred in the Atlantic Ocean with the majority occurring in the northeast.

3.1.2 Disaster Declaration History

The FMPC researched past events that resulted in a federal and/or state emergency or disaster declaration in the planning area for Cutler Bay in order to identify known flood hazards. Federal and/or state disaster declarations may be granted when the Governor certifies that the combined local, county and state resources are insufficient and that the situation is beyond their recovery capabilities. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. Should the disaster be so severe that both the local and state government capacities are exceeded, a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

Details on federal and state disaster declarations were obtained by the FMPC from FEMA and FDEM, and compiled chronologically in Tables 3.2 and 3.3. Table 3.2 displays flood related major disaster declarations that State of Florida has received from FEMA since 2002. This table reflects the vulnerability and historic patterns of flood hazards within the State of Florida.

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 Bonnie	DR-1539	08/13/2004
Severe Storms and Flooding	DR-1481	07/29/2003

Source: Florida State Hazard Mitigation Plan (August 2013), FEMA

A more in-depth review of the state and federal declared disasters for the State of Florida indicated that Miami-Dade County was impacted by five flood related federal disaster declarations between 1960 and 2014. The disaster-related damage to people and property resulted from wind and flood damage associated with hurricanes and tropical storms.

Table 3.3 - FEMA Major Disaster Declarations for Miami-Dade County, 1960 - 2014

Hazard Type	Disaster #	Date	IA Dollars Obligated[1]	PA Dollars Obligated[1]
Hurricane Wilma	DR-1609	10/24/2005	$191,472,426.07	$1,483,085,540.62
Hurricane Katrina	DR-1602	08/28/2005	--	$194,516,321.23
Hurricane Jeanne	DR-1561	09/26/2004	$398,624,417.44	$521,496,151.88
Hurricane Frances	DR-1545	09/04/2004	$411,862,738.49	$667,164,433.62
Hurricane Charley and Tropical Storm Bonnie	DR-1539	08/13/2004	$208,970,753.97	$613,442,592.07
		Total:	**$1,210,930,335.97**	**$3,479,705,039.42**

Source: FEMA, FDEM

[1]Dollar damage values are for all Counties included in the disaster declaration.

3.2 Hazard Profiles

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the…location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

The hazards identified in Section 3.1 Hazard Identification, are profiled individually in this section. Information provided by members of the FMPC has been integrated into this section with information from other data sources.

Each hazard is profiled in the following format:

Hazard/Problem Description

This section provides a description of the hazard followed by details specific to the Cutler Bay planning area. Where available, this section also includes information on the hazard extent, seasonal patterns, speed of onset/duration, magnitude and any secondary effects.

Past Occurrences

This section contains information on historical events, including the extent or location of the hazard within or near the Cutler Bay planning area.

Frequency/Likelihood of Future Occurrence

This section gauges the likelihood of future occurrences based on past events and existing data. The frequency is determined by dividing the number of events observed by the number of years on record and multiplying by 100. This provides the percent chance of the event happening in any given year (e.g. 10 hurricanes or tropical storms over a 30-year period equates to a 33 percent chance of experiencing a hurricane or tropical storm in any given year). The likelihood of future occurrences is categorized into one of the classifications as follows:

- ***Highly Likely*** – Near 100 percent chance of occurrence within the next year
- ***Likely*** – Between 10 and 100 percent chance of occurrence within the next year (recurrence interval of 10 years or less)
- ***Occasional*** – Between 1 and 10 percent chance of occurrence within the next year (recurrence interval of 11 to 100 years)
- ***Unlikely*** – Less than 1 percent chance or occurrence within the next 100 years (recurrence interval of greater than every 100 years).

Those hazards determined to be of high or medium significance were characterized as priority hazards that required further evaluation in Section 3.3 Vulnerability Assessment. Significance was determined by frequency of the hazard and resulting damage, including deaths/injuries and property, crop and economic damage. Hazards occurring infrequently or having little to no impact on the Cutler Bay planning area were determined to be of low significance and not considered a priority hazard. These criteria allowed the FMPC to prioritize hazards of greatest significance and focus resources where they are most needed.

The National Oceanic and Atmospheric Administration's National Climatic Data Center (NCDC) has been tracking severe weather since 1950. The NCDC Storm Events Database contains an archive of destructive storm or weather data and information which includes local, intense and damaging events. This database contains 176 severe weather events that occurred in Miami-Dade County between January 1, 1950 and October 2, 2013. Table 3.4 summarizes these events.

Table 3.4 - NCDC Severe Weather Reports for Miami-Dade County and Cutler Bay, 1950-2013

Type	# of Events	Property Loss	Deaths	Injuries
Flash Flood	26	$101,968,000	0	0
Flood/Urban Flood	6	$75,000	0	0
Heavy Rain	18	$325,000	0	0
Storm Surge/Tide	4	0	0	0
Tropical Depression	1	0	0	0
Tropical Storm	9	$112,000	0	0
Waterspout	112	0	0	0
Total:	**176**	**$102,480,000**	**0**	**0**

Source: National Climatic Data Center Storm Events Database
Note: Losses reflect totals for all impacted areas within Miami-Dade County.

The FMPC supplemented NCDC data with data from SHELDUS™ (Spatial Hazard Events and Losses Database for the United States). SHELDUS™ is a county-level data set for the United States that tracks 18 types of natural hazard events along with associated property and crop losses, injuries, and fatalities for the period 1960-2013. Produced by the Hazards Research Lab at the University of South Carolina, this database combines information from several sources (including the NCDC). For events that covered multiple counties, the dollar losses, deaths, and injuries were equally divided among the affected counties (e.g., if four counties were affected, then a quarter of the dollar losses, injuries, and deaths were attributed to each county).

SHELDUS™ contains information on 82 severe weather events that occurred in Miami-Dade County between 1960 and 2013. Table 3.5 summarizes these events.

Table 3.5 - SHELDUS Severe Weather Reports for Miami-Dade County, 1960-2013

Type	# of Events	Property Loss	Crop Loss	Deaths	Injuries
Coastal	21	$1,498,053.00	$0.00	20	16
Flooding	22	$446,156,299.00	$635,454,713.00	0	0
Hurricane/Tropical Storm	28	$13,972,458,333.00	$789,380,779.00	13	21
Severe Storm/Thunder Storm	11	$575,715.00	$445,422.00	0	0
Total:	**82**	**$14,420,688,400.00**	**$1,425,280,914.00**	**33**	**37**

Source: Hazards & Vulnerability Research Institute (2013). The Spatial Hazard Events and Losses Database for the United States, Version 13.1 [Online Database]. Columbia, SC: University of South Carolina. Available from http://www.sheldus.org
Note: Losses have been adjusted for inflation to 2013 dollars.

The following sections provide profiles of the natural flood hazards that the FMPC identified in Table 3.1 Flood Hazard Summary.

3.2.1 Climate Change and Sea Level Rise

Hazard/Problem Description

Climate change refers to a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forces such as modulations of the solar cycles, volcanic eruptions, and persistent anthropogenic changes in the composition of the atmosphere or in land use (IPCC, 2014). Climate change is a natural occurrence in which the earth has warmed and cooled periodically over geologic time. The recent and rapid warming of the earth over the past century has been cause for concern, as this warming is very likely due to the accumulation of human-caused greenhouse gases, such as CO_2, in the atmosphere (IPCC, 2007). This warming is occurring almost everywhere in the world which suggests a global cause rather than changes in localized weather patterns.

There are generally two separate mechanics involved in global sea level rise. The first is directly attributed to global temperature increases, which warm the oceans waters and cause them to expand. The second is attributed to the melting of ice over land which simply adds water to the oceans. Global sea level rise is likely caused by a combination of these two mechanics and can be exasperated on the local level by factors such as erosion and subsidence.

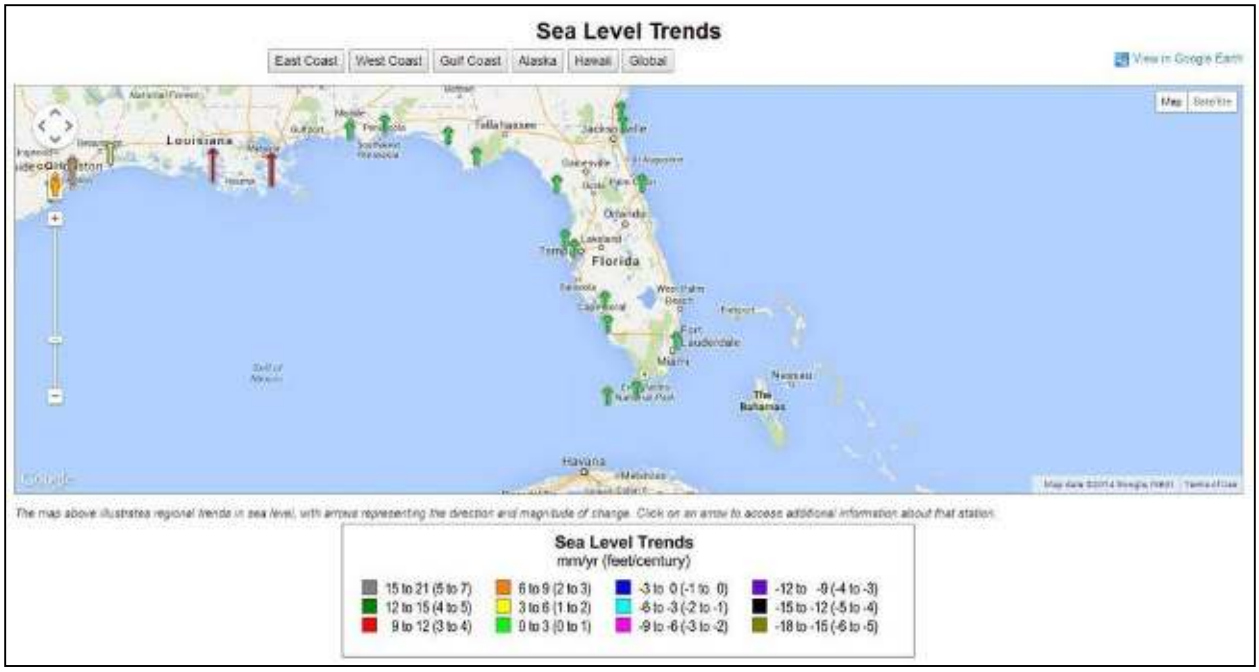
Due to sea-level rise projected throughout the 21st century and beyond, coastal systems and low-lying areas will increasingly experience adverse impacts such as submergence, coastal flooding, and coastal erosion. The population and assets projected to be exposed to coastal risks as well as human pressures on coastal ecosystems will increase significantly in the coming decades due to population growth, economic development, and urbanization (IPCC, 2014). South Florida is particularly vulnerable to the effects of climate change and sea level rise, due to its populous coastal counties, subtropical environment, porous geology and low topography. However, a 1 foot sea level rise projection on the Town of Cutler Bay is shown on figure 3.25 in Section 3.3.2.

Climate change has the potential to alter the nature and frequency of flood hazards that the Town already experiences such as hurricane storm surge, coastal erosion, and stormwater drainage. Sea level rise may also place additional stress on aquifers (saltwater intrusion) and gravity flow stormwater and septic systems to a rising groundwater table. An elevated storm surge due to sea level rise could produce a cascade of consequences affecting things such as land use, infrastructure, facilities, waterway navigation, the local economy, public health and safety, drinking water supplies, and ecosystems.

The potential for climate change influences on each flood hazard summarized in this plan is noted within each of the hazard's "Frequency/Likelihood of Future Occurrence" discussion section.

Past Occurrences

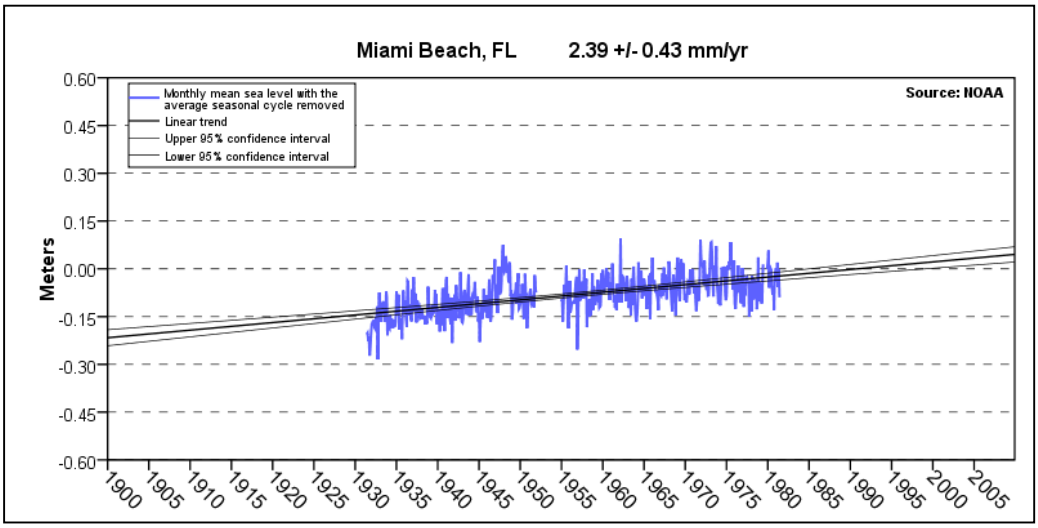
The rate of sea level rise has varied throughout geologic history, and studies have shown that global temperature and sea level are strongly correlated. The Center for Operational Oceanographic Products and Services within NOAA has been measuring sea level for over 150 years, with tide stations operating on all U.S. coasts. Changes in Mean Sea Level (MSL), either a sea level rise or sea level fall, have been computed at 128 long-term water level stations using a minimum span of 30 years of observations at each location. These measurements have been averaged by month to remove the effect of higher frequency phenomena (e.g. storm surge) in order to compute an accurate linear sea level trend. Figure 3.1 illustrates the regional trends in sea level appropriate for the Cutler Bay planning area.



Source: http://tidesandcurrents.noaa.gov/sltrends/sltrends.shtml

Figure 3.1 – Gulf/Atlantic Coast Sea Level Trends

Figure 3.2 shows the monthly mean sea level at NOAA's Miami Beach, FL station which is the station located closest to the Cutler Bay planning area. The mean sea level trend at the Miami Beach, FL station is 2.39 millimeters/year with a 95% confidence interval of +/- 0.43 mm/yr based on monthly mean sea level data from 1931 to 1981 which is equivalent to a change of 0.78 feet in 100 years.



Source: http://tidesandcurrents.noaa.gov/sltrends/sltrends.shtml

Figure 3.2 - Mean Sea Level Trend for Miami Beach, Florida

Frequency/Likelihood of Future Occurrence

Occasional –

Temperature Trends

As previously mentioned, studies have shown that global temperature and sea level are strongly correlated. Since 1901, the average surface temperature across the contiguous 48 states has risen at an average rate of 0.14°F per decade (1.4°F per century). Average temperatures have risen more quickly since the late 1970s (0.36 to 0.55°F per decade). Seven of the top 10 warmest years on record for the contiguous 48 states have occurred since 1998, and 2012 was the warmest year on record. Figure 3.3 below provided by the EPA shows how annual average air temperatures have changed in different parts of the United States since 1901. The rate of temperature change for southeast Florida is 3°F per century. Current science is projecting that the southeastern United States could experience a general increase in average temperatures anywhere from 4.5°F to 9°F in the coming century (Karl et al, 111).

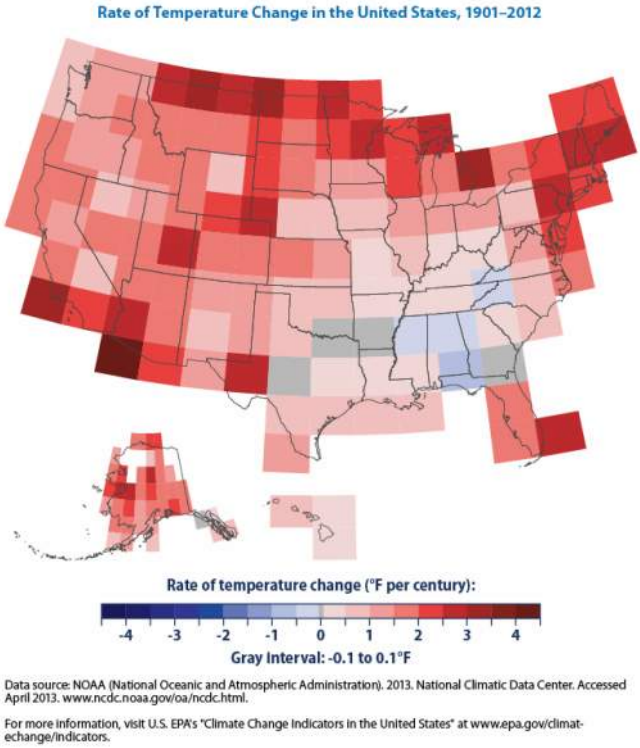


Figure 3.3- Rate of Temperature Change in the United States, 1901-2012

Sea Level Trends

Recognizing the variability in local sea level rise projections, the Southeast Florida Regional Climate Change Compact (SFRCCC) was created in order to unify the existing southeast Florida sea level rise projections and create a single projection for regional planning purposes. The SFRCCC consists of the county commissions of Monroe, Miami-Dade, Broward and Palm Beach Counties.

Key participants in developing existing sea level rise projections were invited to participate in the Regional Climate Change Compact Technical Ad hoc Work Group (Work Group). The Work Group reviewed available scientific literature to develop a unified sea level rise projection to be used as a guide for future policy decision makers. The Work Group ultimately agreed that the U.S. Army Corps of Engineers Guidance Document curves (USACE, 2009) offered a reasonable and defensive projection to be used for planning purposes in the southeast Florida region. The USACE projection uses Key West

tidal data from 1913-1999 as the foundation for the projection and references the year 2010 as the starting date as shown in Figure 3.4. Sea level rise is currently projected at 3-7 inches by 2030 and 9-24 inches by 2060.

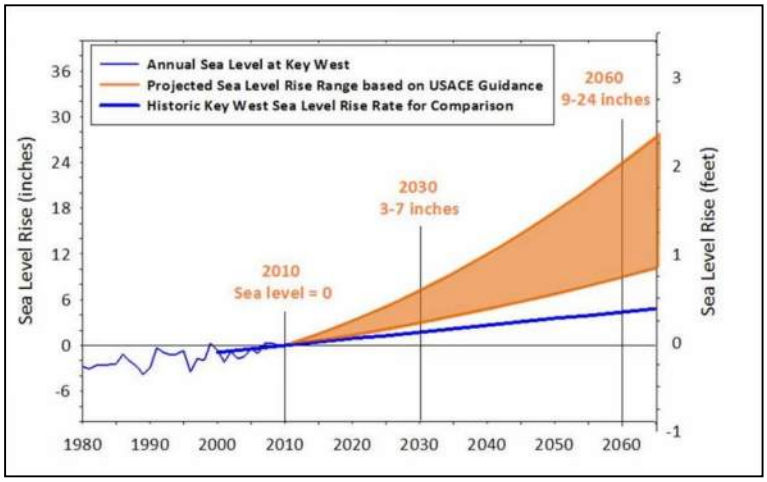


Figure 3.4 - Southeast Florida Sea Level Rise Projection

Source: Southeast Florida Regional Climate Compact, *A Unified Sea Level Rise Projection for Southeast Florida, April 2011.*

Table 3.6 shows the projected change in the rate of rise of sea level by decade, illustrating the acceleration of rate with time.

Table 3.6 - Projected Rate of Sea Level Rise by Decade

Time Range		Decadal Rate of Rise	
	Projected Rise (Inches)	Historic (Inches/Decade)	Projected Rate of Sea Level Rise (Inches/Decade)
		0.82 - 0.94	
2010-2020	1.5 - 3.0		1.4 - 3.2
2020-2030	3.0 - 7.0		1.6 - 4.0
2030-2040	5.0 - 12.0		1.8 - 4.8
2040-2050	7.0 - 17.5		2.0 – 5.6
2050-2060	9.0 - 24.0		2.2 – 6.3

Source: Southeast Florida Regional Climate Compact, *A Unified Sea Level Rise Projection for Southeast Florida, April 2011.*

According to the SFRCCC, scientific evidence strongly supports that sea level is rising and will continue to rise beyond 2060 even if mitigation efforts to reduce greenhouse gas emission are successful. Uncertainties in sea level rise projections do exist due to natural variability, limitations of existing computer models, and the inability to forecast human response in limiting greenhouse gas emissions. Therefore, projections will need to be reviewed and revised in the future as modeling capabilities improve and major findings in climate science data become available.

Ultimately, it is important to understand that sea level rise is not an endpoint but rather a continuing trend, and Cutler Bay must consider and plan for sea level rise in future policy decisions. Understanding trends in sea level, as well as the relationship between global and local sea level, provides critical information about the potential impacts of climate change and sea level rise on the Cutler Bay planning area. By examining local rates of sea level change and local projections for sea level rise at 3-7 inches by 2030 and 9-24 inches by 2060, Cutler Bay can begin to analyze and plan for the impacts of sea level rise in long-range planning.

3.2.2 Coastal/Canal Bank Erosion

Hazard/Problem Description

Coastal Erosion

Coastal erosion is a process whereby large storms, flooding, strong wave action, sea level rise, and human activities, such as inappropriate land use, alterations, and shore protection structures, wears away the beaches and bluffs along the coast. Erosion undermines and often destroys homes, businesses, and public infrastructure and can have long-term economic and social consequences. According to NOAA, coastal erosion is responsible for approximately $500 million per year in coastal property loss in the United States, including damage to structures and loss of land. To mitigate coastal erosion, the federal government spends an average of $150 million every year on beach nourishment and other shoreline erosion control measures.

Coastal erosion has both natural causes and causes related to human construction activities. Gradual coastal erosion results naturally from the very slow rise of sea-level. Severe coastal erosion can occur over a very short period of time when the state is impacted by hurricanes, tropical storms and other weather systems. In Florida, sand is moved parallel to most beaches by longshore drift and currents. Sand is continually removed by longshore currents in some areas but it is also continually replaced by sand carried in by the same type of currents. Structures such as piers or sea walls, jetties, and navigational inlets may interrupt the movement of sand, and sand can become "trapped" in one place by these types of structures. The currents will continue to flow, though depleted of sand trapped elsewhere which leads to erosion.

Erosion rates and potential impacts are highly localized. Average coastline recession rates of 25 feet per year are not uncommon on some barrier islands in the Southeast. Severe storms can remove even wider beaches, along with substantial dunes, in a single event. In undeveloped areas, these high recession rates are not likely to cause significant concern, but in some heavily populated locations, one or two feet of erosion may be considered catastrophic (NOAA, 2014).

Canal Bank Erosion

Streams/canals erode by a combination of direct stream processes, like down cutting and lateral erosion, and indirect processes, like mass-wasting accompanied by transportation. When the channel bends, water on the outside of the bend (the cut-bank) flows faster and water on the inside of the bend (the point) flows slower as shown in Figure 3.5. This distribution of velocity results in erosion occurring on the outside of the bend and deposition occurring on the inside of the bend.

Stream bank erosion is a natural process, but acceleration of this natural process leads to a disproportionate sediment supply, stream channel instability, land loss, habitat loss and other adverse effects. Stream bank erosion processes, although complex, are driven by two major components: stream bank characteristics (erodibility) and hydraulic/gravitational forces. Many land use activities can affect both of these components and lead to accelerated bank erosion. The vegetation rooting characteristics can protect banks from fluvial entrainment and collapse, and also provide internal bank strength. When riparian vegetation is changed from woody species to annual grasses and/or forbs, the internal strength is weakened, causing acceleration of mass wasting processes. When land use changes occur in a watershed, such as clearing land for agriculture or development, runoff increases. With this increase in runoff the stream channel will adjust to accommodate the additional flow, increasing streambank erosion. Stream bank aggradation or degradation is often a response to stream channel instability. Since bank erosion is often a symptom of a larger, more complex problem, the long-term solutions often involve much more than just bank stabilization. As a result canal bank erosion can occur throughout the Town of Cutler Bay as shown on Figure 3.13 (Cutler Bay Canal System) in Section 3.2.5.

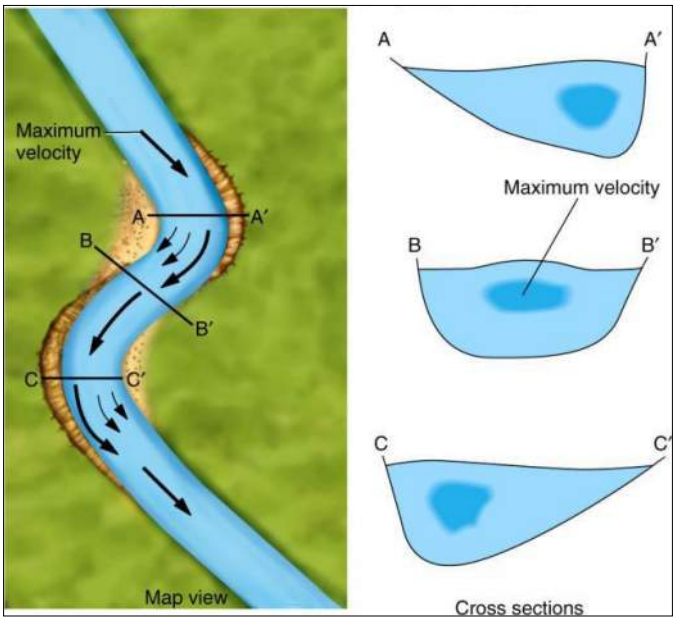


Figure 3.5- Stream Meanders

Past Occurrences

Miami-Dade County has been addressing coastal erosion since 1975 and invests approximately $6 million annually in beach restoration. However, unlike other communities within Miami-Dade County affected by coastal erosion, the shoreline of Biscayne Bay (the eastern boundary of the Cutler Bay planning area) is protected by mangroves within Biscayne National Park which assist in shoreline protection and stabilization. The tangled root systems of the mangroves trap sediments which prevents coastal erosion. Mangroves also assist in buffering the coastal zone from tropical storms and hurricanes as their branches and root systems create friction that reduces the force of winds and waves. Therefore, the mangroves play a large role in protecting Cutler Bay from coastal erosion. As a result, coastal erosion does not pose an imminent threat to insurable buildings in Cutler Bay.

Cutler Bay has reported one localized instance of limited canal erosion. A search of the NCDC database and SHELDUS database resulted in no past occurrences of coastal erosion or canal bank erosion. Furthermore, a report completed in June 2012 by the Florida Department of Environmental Protection (DEP), Division of Water Resource Management, titled "Critically Eroded Beaches in Florida" which inventoried critically eroded areas along the Atlantic and Gulf coasts did not identify any areas of erosion within the Cutler Bay planning area.

Canal Erosion on SW 194th Street

Frequency/Likelihood of Future Occurrence

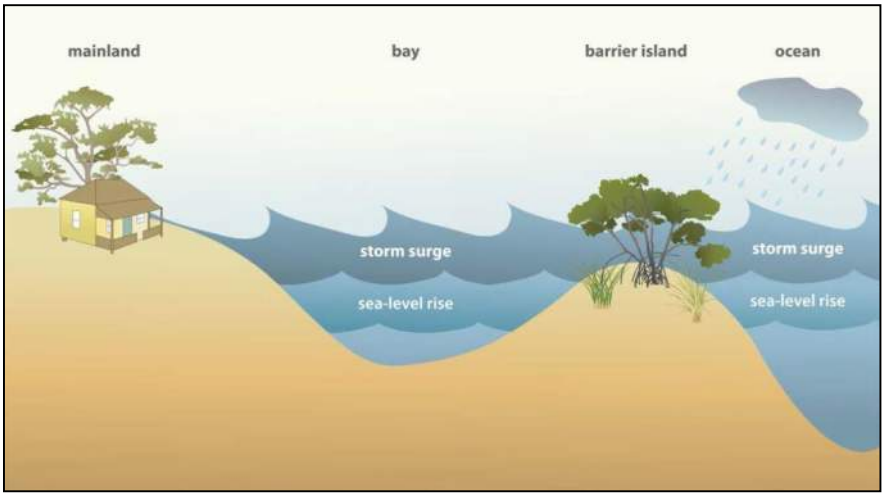
Likely – Several known localized instances of canal erosion prove that his hazard should be considered as a likely concern. However, no structural damage of insurable structures has occurred and is not likely to impact any buildings.

Coastal erosion is an unlikely concern for Cutler Bay.

However, it is paramount that Cutler Bay continues to maintain the natural flood protection benefits and floodplain functions provided by Biscayne National Park. This coastal flood zone should remain preserved and undeveloped in order to continue to protect the Cutler Bay planning area from coastal erosion. In areas along the canal system throughout the Cutler Bay Planning area, the extent of canal bank erosion is an average of 1 to 2 feet of erosion along the top and/or sides of canal banks. The maintenance of the canal system is the responsibility of Miami-Dade County and the South Florida Water Management District.

Climate Change and Coastal/Canal Bank Erosion

Sea-level rise will raise all tide levels, from low tide to storm surge. Wave action at higher tide levels may cause erosion of sandy beaches. Higher storm surges, which may be accompanied by stronger storm winds, could wash over the tops of sand dunes, flooding the burrows of dune-nesting animals. The combined effects of wind and waves could damage dunes, leaving the beachfront more vulnerable. (UF/IFAS Extension, 2013).



Credits: Jane Hawkey, IAN Image Library (ian.umces.edu/imagelibrary/)

Figure 3.6 - Seal Level Rise and Coastal Erosion of Dunes

According to the Center of Ocean Solutions, there has been a dramatic increase in coastal erosion over the last two decades and this is expected to continue as sea level rises and storm frequency and severity increase. Rather than occurring over the same time scale with sea level rise, erosion of beaches and coastal cliffs is expected to occur in large bursts during storm events as a result of increased wave height and storm intensity. Because of these large events, scientific models predict that shoreline erosion may outpace sea level rise by 50 to 200 fold. Erosion will have significant effects on coastal habitats, which can lead to social and economic impacts on coastal communities. With the reduction of coastal habitats and the ecological services they provide, coastal communities will experience more frequent and destructive flooding, compromised water supplies and smaller or fewer beaches.

3.2.3 Dam/Levee Failure

Hazard/Problem Description

Dam Failure

A dam is a barrier constructed across a watercourse that stores, controls, or diverts water. Dams are usually constructed of earth, rock, or concrete. The water impounded behind a dam is referred to as the

reservoir and is measured in acre-feet. One acre-foot is the volume of water that covers one acre of land to a depth of one foot. Dams can benefit farm land, provide recreation areas, generate electrical power, and help control erosion and flooding issues.

A dam failure is the collapse or breach of a dam that causes downstream flooding. Dam failures may be caused by natural events, human-caused events, or a combination. Due to the lack of advance warning, failures resulting from natural events, such as hurricanes, earthquakes, or landslides, may be particularly severe. Prolonged rainfall and subsequent flooding is the most common cause of dam failure.

Dam failures usually occur when the spillway capacity is inadequate and water overtops the dam or when internal erosion in 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 anything in its path. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failures can result from any one or a combination of the following:

- Prolonged periods of rainfall and flooding;
- Inadequate spillway capacity, resulting in excess overtopping flows;
- Internal erosion caused by embankment or foundation leakage or piping;
- Improper maintenance, including failure to remove trees, repair internal seepage problems, replace lost material from the cross-section of the dam and abutments, or maintain gates, valves, and other operational components;
- Improper design, including the use of improper construction materials and construction practices;
- Negligent operation, including the failure to remove or open gates or valves during high flow periods;
- Failure of upstream dams on the same waterway; and
- High winds, which can cause significant wave action and result in substantial erosion.

Water released by a failed dam generates tremendous energy and can cause a flood that is catastrophic to life and property. A catastrophic dam failure could challenge local response capabilities and require evacuations to save lives. Impacts to life safety will depend on the warning time and the resources available to notify and evacuate the public. Major casualties and loss of life could result, as well as water quality and health issues. Potentially catastrophic effects to roads, bridges, and homes are also of major concern. Associated water quality and health concerns could also be issues. Factors that influence the potential severity of a full or partial dam failure are the amount of water impounded; the density, type, and value of development and infrastructure located downstream; and the speed of failure.

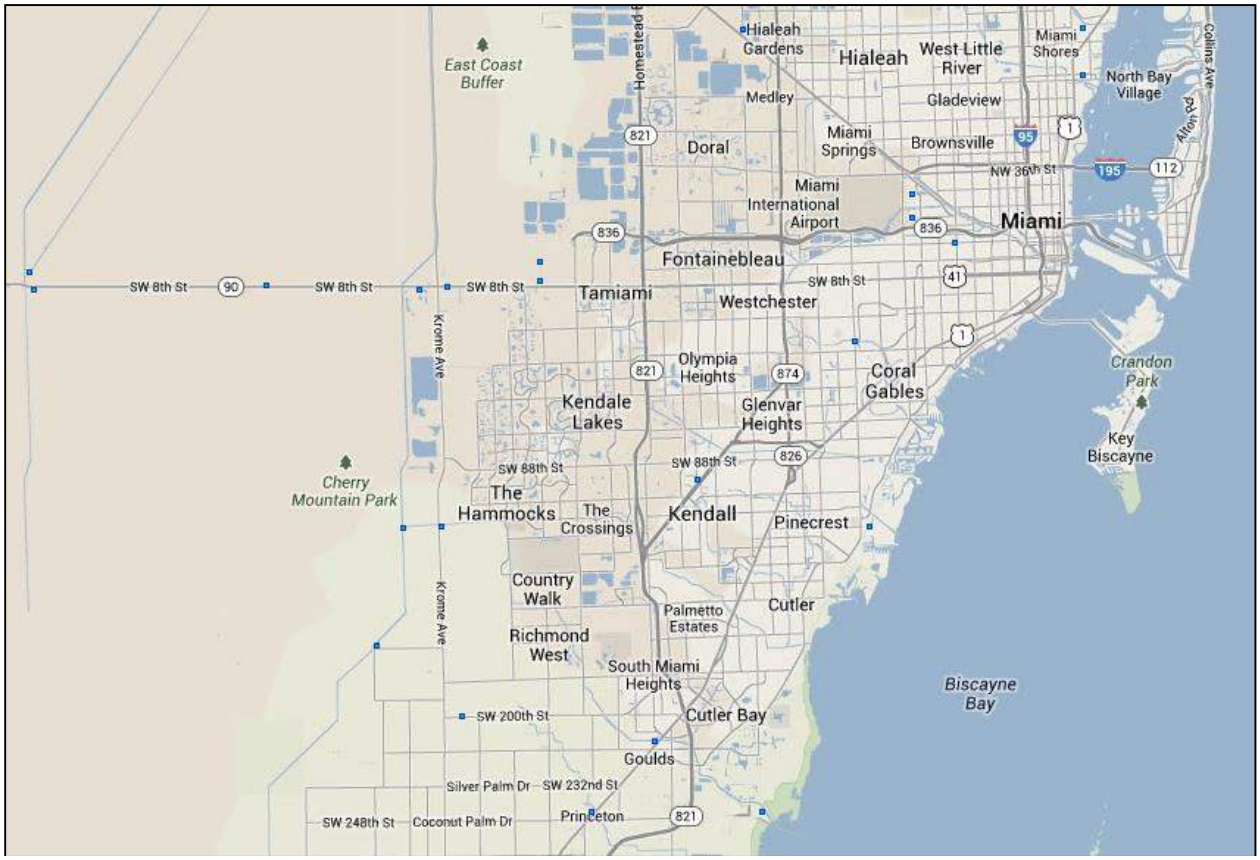
The National Inventory of Dams (NID) is a database of dams in the United States which was developed and is maintained by the USACE. Congress authorized the USACE to inventory dams as part of the 1972 National Dam Inspection Act. Several subsequent acts have authorized maintenance of the NID and provided funding. The USACE collaborates with FEMA and state regulatory offices to collect data on dams. The goal of the NID is to include all dams in the United States which meet at least one of the following criteria:

1. High hazard classification - loss of at least one human life is likely if the dam fails
2. Significant hazard classification - possible loss of human life and likely significant property or environmental destruction

3. Equal or exceed 25 feet in height and exceed 15 acre-feet in storage
4. Equal or exceed 50 acre-feet storage and exceed 6 feet in height

Low hazard dams which do not meet the criteria specified in number 3 or 4 are not included in the NID even if they are regulated according to state criteria. In some states, the number of these dams is several times the number of dams included in the NID.

Figure 3.7 reflects all dams included in the NID that are located around the Cutler Bay planning area. There are no dams located within the jurisdictional boundaries of Cutler Bay and no areas within Cutler Bay that could be affected by a dam failure. Table 3.7 details all dams located within Miami-Dade County as included in the NID.



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

Figure 3.7- National Inventory of Dams for Cutler Bay

Table 3.7 - National Inventory of Dams, Miami-Dade County

Dam Name	NIDID	Owner	Height (Ft.)	NID Storage (acre-feet)	Primary Purpose	River
Structure 338	FL00690	SFWMD	26	242	Other	CANAL 1
Structure No. 148	FL00390	SFWMD	20	2977	Flood Control	BLACK CREEK (C-1)
Structure No. 21	FL00399	SFWMD	20	853	Flood Control	BLACK CREEK (C-1)
Structure No. 20A	FL00402	SFWMD	32	495	Flood Control	CANAL 106
Structure No. 333	FL00681	SFWMD	23	2726900	Other	LEVEE 29 BORROW CANAL

Dam Name	NIDID	Owner	Height (Ft.)	NID Storage (acre-feet)	Primary Purpose	River
Structure No. 166	FL00386	SFWMD	23	92	Flood Control	MOWRY CANAL (C-103(N))
Structure No. 22	FL00394	SFWMD	23	1270	Flood Control	SNAPPER CREEK CANAL (C-2)
Structure No. 337	FL00693	SFWMD	15	545380	Irrigation	S-31 BYPASS CANAL
Structure No. 165	FL00387	SFWMD	22	507	Flood Control	PRINCETON CANAL (C-102)
Structure No. 21A	FL00400	SFWMD	31	527	Flood Control	PRINCETON CANAL (C-102)
Structure No. 194	FL00381	SFWMD	24	1039	Flood Control	PRINCETON CANAL (C-102)
Structure No. 173	FL00376	SFWMD	20	2977	Flood Control	LEVEE 31N BORROW CANAL
Structure No. 25	FL00688	SFWMD	13	560	Other	COMFORT CANAL (C-5)
Structure No. 197	FL00389	SFWMD	14	1326	Flood Control	AEROJET CANAL (C-111)
Structure No. 20	FL00403	SFWMD	27	495	Flood Control	MODEL LAND CANAL (C-107)
Structure No. 30	FL00383	SFWMD	14	292	Flood Control	SNAKE CREEK CANAL (C-9)
Structure No. 176	FL00373	SFWMD	23	1639	Flood Control	AEROJET CANAL (C-111)
Structure No. 27	FL00405	SFWMD	20	1400	Flood Control	LITTLE RIVER CANAL (C-7)
Structure No. 32	FL00385	SFWMD	16	292	Flood Control	LEVEE 33 BORROW CANAL
Structure No. 29	FL00407	SFWMD	21	3410	Flood Control	SNAKE CREEK CANAL (C-9)
Structure No. 25B	FL00679	SFWMD	21	1500	Flood Control	TAMIAMI CANAL (C-4)
Structure No. 20F	FL00401	SFWMD	32	683	Flood Control	MOWRY CANAL (C-103)
Structure No. 31	FL00384	SFWMD	24	545380	Flood Control	MIAMI CANAL (C-6)
Structure No. 196	FL00377	SFWMD	13	1039	Flood Control	MOWRY CANAL (C-103)
Structure No. 26	FL00404	SFWMD	25	1460	Flood Control	MIAMI RIVER (NORTH FORK)
Structure No. 121	FL00392	SFWMD	13	1000	Flood Control	--
Structure No. 28	FL00406	SFWMD	21	1247	Flood Control	BISCAYNE CANAL (C-8)
Structure No. 336	FL00683	SFWMD	18	545380	Other	TAMIAMI CANAL (C-4)
Structure No. 32A	FL00691	SFWMD	17	2618	Other	LEVEE 30 BORROW CANAL
G93 Control Structure	FL76008	SFWMD	12	280	Flood Control	C-3 CANAL
Structure No. 179	FL00388	SFWMD	32	812	Flood Control	MOWRY CANAL (C-103)
G211Control	FL76001	SFWMD	22	600	Flood Control	C-1W CANAL

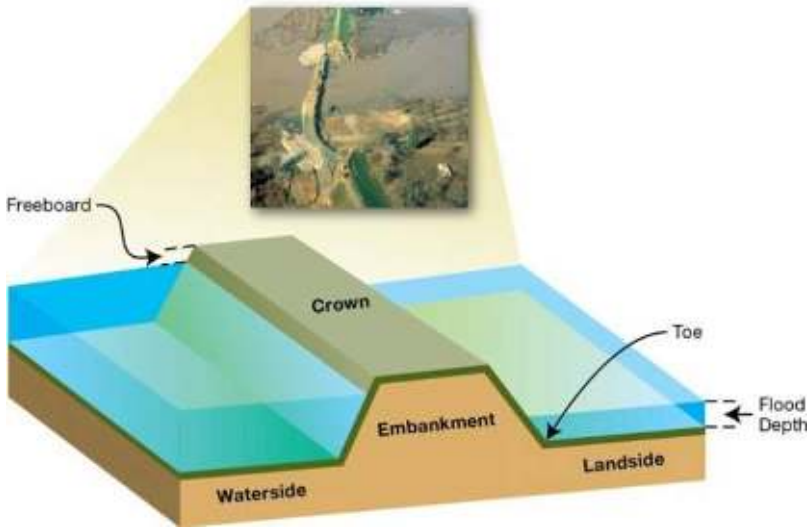
Dam Name	NIDID	Owner	Height (Ft.)	NID Storage (acre-feet)	Primary Purpose	River
Structure						
C4 EDB South Control Structure	FL76003	SFWMD	11	1872	Flood Control	TAMIAMI CANAL
C4 EDB East Control Structure	FL76002	SFWMD	11	1872	Flood Control	TAMIAMI CANAL
G119 Control Structure	FL76004	SFWMD	22	40000	Water Supply	TAMIAMI CANAL (C4)
G58 Control Structure	FL76005	SFWMD	14	200	Other	ARCH CREEK
G70 Control Structure	FL76006	SFWMD	20	42220	Fish and Wildlife Pond	L-29 CANAL
G72 Control Structure	FL76007	SFWMD	14	1250	Other	C-7 EXTENSION CANAL

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

Levee Failure

FEMA defines a levee as "a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water in order to reduce the risk from temporary flooding." Levee systems consist of levees, floodwalls, and associated structures, such as closure and drainage devices, which are constructed and operated in accordance with sound engineering practices. Levees often have "interior drainage" systems that work in conjunction with the levees to take water from the landward side to the water side. An interior drainage system may include culverts, canals, ditches, storm sewers, and/or pumps.

Levees and floodwalls are constructed from the earth, compacted soil or artificial materials, such as concrete or steel. To protect against erosion and scouring, earthen levees can be covered with grass and gravel or hard surfaces like stone, asphalt, or concrete. Levees and floodwalls are typically built parallel to a waterway, most often a river, in order to reduce the risk of flooding to the area behind it. Figure 3.8 below shows the components of a typical levee.

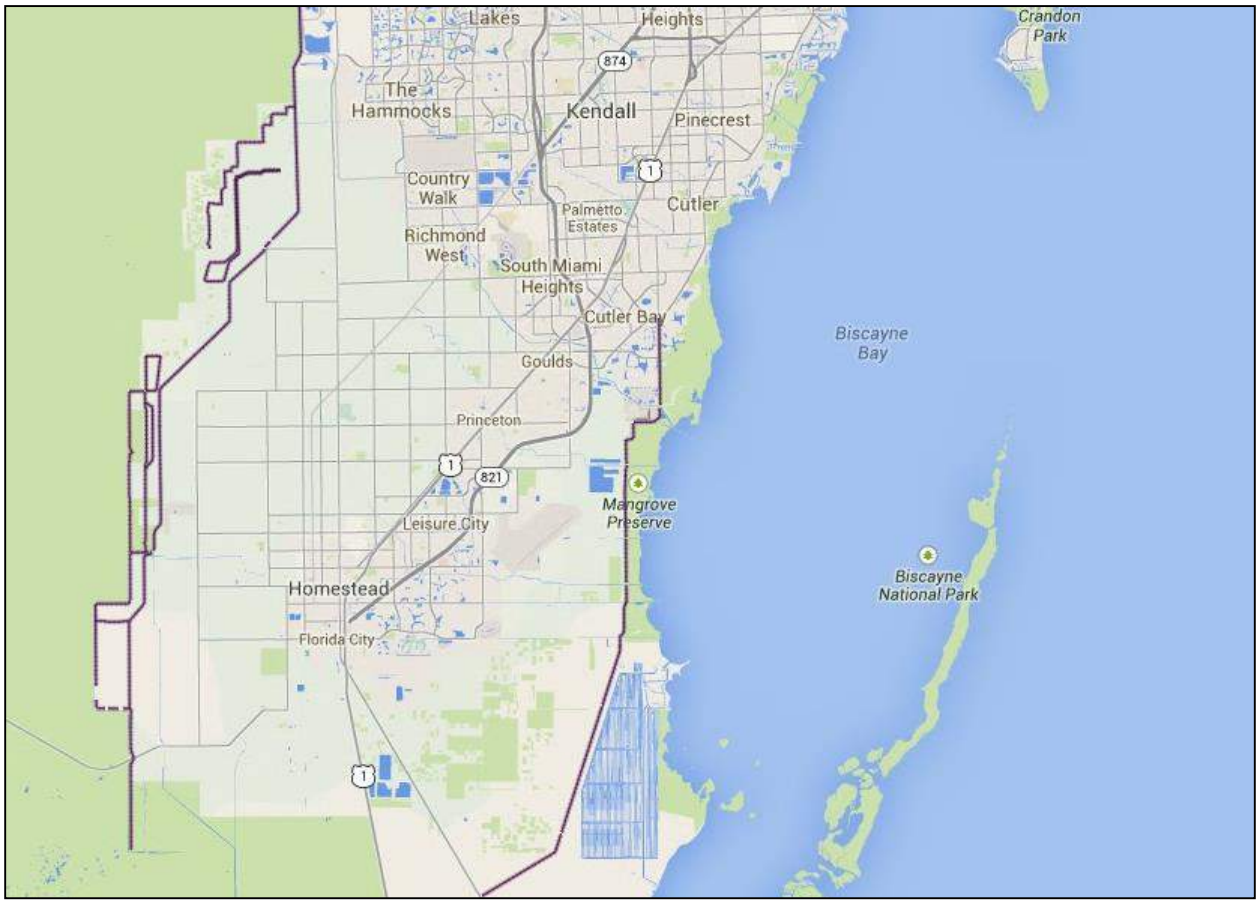


Source: FEMA, *What is a Levee Fact Sheet*, August 2011

Figure 3.8- Components of a Typical Levee

Levees provide strong flood protection, but they are not failsafe. Levees are designed to protect against a specific flood level and could be overtopped during severe weather events. Levees reduce, not eliminate, the risk to individuals and structures behind them. A levee system failure or overtopping can create severe flooding and high water velocities. It is important to remember that no levee provides protection from events for which it was not designed, and proper operation and maintenance are necessary to reduce the probability of failure.

Figure 3.9 below reflects all levees included in the U.S. Army Corps of Engineers National Levee Database (NLD). Levee centerlines are indicated in purple. Table 3.8 details all levees within a 25 mile radius of the Town of Cutler Bay as included in the NLD. No areas with Cutler Bay could potentially be affected by a levee failure.



Source: U.S. Army Corps of Engineers National Levee Database

Figure 3.9 - National Levee Database for Cutler Bay

Table 3.8 - National Levee Database, Cutler Bay Planning Area

County(ies)	System Name	Sponsor	Length (mi)	Inspection Rating	Leveed Area Type
Broward, Hendry, Miami-Dade, Palm Beach	L-38 Section 2	SFWMD	3.74	Minimally Acceptable	Agricultural
Miami-Dade	East Coast, L-30	SFWMD	13.88	Minimally Acceptable	Urban
Miami-Dade	L-31 East	SFWMD	18.91	Minimally Acceptable	Rural
Miami-Dade	8.5 Square Mile Area	SFWMD	13.38	Minimally	Urban

County(ies)	System Name	Sponsor	Length (mi)	Inspection Rating	Leveed Area Type
				Acceptable	
Miami-Dade	L-31W Segment 3	SFWMD	5.15	Minimally Acceptable	Agricultural
Miami-Dade	L-31 West	SFWMD	16.5	Minimally Acceptable	Urban
Miami-Dade	C-111 SD South	SFWMD	6.76	Minimally Acceptable	Agricultural
Broward, Collier, Miami-Dade, Monroe	L-29	SFWMD	45.38	Unacceptable	Agricultural
Broward, Miami-Dade	East Coast, L-33	SFWMD	8.17	Minimally Acceptable	Urban
Miami-Dade	C-111 SD North	SFWMD	5.86	Minimally Acceptable	Agricultural
Broward, Miami-Dade	WCA-3B	SFWMD	51.89	Minimally Acceptable	Agricultural
Miami-Dade	L-31 North	SFWMD	21.11	Minimally Acceptable	Urban

Source: U.S. Army Corps of Engineers National Levee Database

Past Occurrences

There are no past reported dam breaches or levee failures within Cutler Bay.

Frequency/Likelihood of Future Occurrence

Unlikely –There are no high or significant hazard dams located within Cutler Bay, and there are no documented occurrences of past levee failure. Therefore, the extent of dam and levee failure on the Cutler Bay planning area would be negligible and have no effect (0 feet) in rising flood levels.

It should be noted that there are no levees within Cutler Bay that have been certified by FEMA to protect against the 100-year flood. Therefore, Cutler Bay residents should not be lulled into a false sense of security by the surrounding levees as no level of protection is guaranteed. In fact, areas behind levees that cannot be certified are typically considered high-risk areas.

Climate Change and Dam/Levee Failure

While average annual rainfall may increase or decrease slightly as a result of climate change, the intensity of individual rainfall events is likely to increase which could overwhelm fragile flood control systems. Climate change is unlikely to change the risk of the Town to dam failure. However, future levees and sea walls may need to be built to combat the effects of sea level rise and storm surge which would affect future risk.

3.2.4 Flood: 100-/500-year

Hazard/Problem Description

Flooding is defined by the rising and overflowing of a body of water onto normally dry land. Flooding can result from an overflow of inland or tidal waters or an unusual accumulation or runoff of surface waters from any source. Flooding within Cutler Bay can be attributed to tidal flooding resulting from hurricanes and tropical storms and heavy rainfall that overburdens the drainage system within the community.

The primary source of flooding in Cutler Bay is due to stormwater runoff where catch basins and the underground drainage system are not able to handle heavy rainfall events. This type of flooding causes

intersections to become impassible and sometimes affects nearby buildings. The FMPC and Town staff identified several locations where localized stormwater flooding occurs.

During major flood events the canal system has the potential to overflow which can impact nearby properties. Because the water table is extremely high in south Florida, the potential for canal flooding is prominent during major events.

Coastal storm surge can impact properties in eastern Cutler Bay especially in the Saga Bay area. The last time properties were affected by storm surge was during Hurricane Andrew. The Cutler Wetlands which sits between Key Biscayne National Park and Saga Bay provides some protection from coastal storm surge flooding.

Sources and Types of Flooding

In Cutler Bay, all flooding can be defined as coastal, drainage or flash flooding. Most drainage related flooding results from intrusion of tide water into drainage outlets which prevents drainage features from operating as they were designed.

Coastal (Tidal) Flooding: All lands bordering the coast along Biscayne Bay are prone to tidal affects/flooding. Coastal land such as sand bars, barrier islands and deltas provide a buffer zone to help protect human life and real property relative to the sea much as flood plains provide a buffer zone along rivers and other bodies of water. Coastal floods usually occur as a result of abnormally high tides or tidal waves, storm surge and heavy rains in combination with high tides, tropical storms and hurricanes.

Drainage: Drainage flooding occurs primarily in urban or developed areas when the volume of runoff exceeds the capacity of the drainage system. Flooding of this nature can be the result of increased development, inadequate drainage structures, riverine flooding, coastal flooding or a combination of these causes.

Flash or Rapid Flooding: Flash flooding is the result of heavy, localized rainfall, possibly from slow-moving intense thunderstorms that cause small streams to overflow. In Cutler Bay, flash floods are most common when rain fall on built-up areas where impervious surfaces, gutters and storm sewers speed up the flow of run-off. These flood waters have high velocities that are capable of sweeping everything in their path.

Health Hazards Associated with Flooding

Certain health hazards are also 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.

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.

Another health hazard occurs when heating ducts in a forced air system are not properly cleaned after inundation. When the furnace or air conditioner is turned on, the sediments left in the ducts are circulated throughout the building and breathed in by the occupants. If the county water system loses pressure, a boil order may be issued to protect people and animals from contaminated water.

The third problem is the long-term psychological impact of having been through a flood and seeing one's home damaged and personal belongings destroyed. The cost and labor needed to repair a flood-damaged home puts a severe strain on people, especially the unprepared and uninsured. There is also a long-term problem for those who know that their homes can be flooded again. The resulting stress on floodplain residents takes its toll in the form of aggravated physical and mental health problems.

Flooding and Floodplains

The area adjacent to a channel is the floodplain, as shown in Figure 3.10. A floodplain is flat or nearly flat land adjacent to a stream or river that experiences occasional or periodic flooding. It includes the floodway, which consists of the stream channel and adjacent areas that carry flood flows, and the flood fringe, which are areas covered by the flood, but which do not experience a strong current.

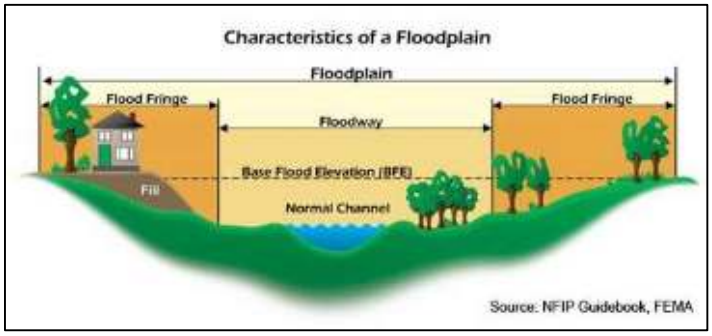


Figure 3.10 - Characteristics of a Floodplain

In its common usage, the floodplain most often refers to that area that is inundated by the 100-year flood, the flood that has a 1% chance in any given year of being equaled or exceeded. The 100-year flood is the national minimum standard to which communities regulate their floodplains through the National Flood Insurance Program (NFIP). The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year. The potential for flooding can change and increase through various land use changes and changes to land surface, which result in a change to the floodplain. A change in environment can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

The Town of Cutler Bay has been a participant in the NFIP since August 31, 2006. Cutler Bay has achieved a Class 6 flood insurance rating through participation in the NFIP's Community Rating System which rewards all policyholders in the Town with a 20 percent reduction in their flood insurance premiums. Tables 3.9 – 3.12 reflect NFIP policy and claims data for the Town categorized by structure type, flood zone, Pre-FIRM and Post-FIRM.

Table 3.9 - NFIP Policy and Claims Data by Structure Type

Structure Type	Number of Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
Single Family	2,623	$1,592,000	$640,369,700	4	$127,940
2-4 Family	23	$10,150	$4,922,000	0	$0
All Other Residential	651	$111,094	$75,238,600	0	$0
Non-Residential	28	$41,538	$12,736,600	0	$0
Total	**3,325**	**$1,754,782**	**$733,266,900**	**4**	**$127,940**

Source: FEMA Community Information System, April 2014

Table 3.10 - NFIP Policy and Claims Data by Flood Zone

Flood Zone	Number of Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
A01-30 & AE Zones	2,482	$1,433,176	$517,974,300	1	$6,388
A Zones	0	$0	$0	0	$0
AO Zones	0	$0	$0	0	$0
AH Zones	535	$196,197	$127,246,300	1	$37,858
AR Zones	0	$0	$0	0	$0
A99 Zones	0	$0	$0	0	$0
V01-30 & VE Zones	0	$0	$0	0	$0
V Zones	0	$0	$0	0	$0
D Zones	0	$0	$0	0	$0
B, C & X Zone	0	$0	$0	0	$0
Standard	5	$5,990	$1,223,300	1	$46,367
Preferred	303	$119,419	$86,823,000	1	$37,327
Total	**3,325**	**$1,754,782**	**$733,266,900**	**4**	**$127,940**

Source: FEMA Community Information System, April 2014

Table 3.11 - NFIP Policy and Claims Data Pre-FIRM

Flood Zone	Number of Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
A01-30 & AE Zones	1,128	$565,394	$196,551,500	0	$0
A Zones	0	$0	$0	0	$0
AO Zones	0	$0	$0	0	$0
AH Zones	482	$176,615	$114,464,800	1	$37,858
AR Zones	0	$0	$0	0	$0
A99 Zones	0	$0	$0	0	$0
V01-30 & VE Zones	0	$0	$0	0	$0
V Zones	0	$0	$0	0	$0
D Zones	0	$0	$0	0	$0
B, C & X Zone	242	$99,243	$68,388,000	1	$46,367
Standard	3	$4,463	$975,000	1	$46,367

Flood Zone	Number of Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
Preferred	239	$94,780	$67,413,000	0	$0
Total	**1,852**	**$841,252**	**$379,404,300**	**2**	**$84,225**

Source: FEMA Community Information System, April 2014

Table 3.12 - NFIP Policy and Claims Data Post-FIRM

Flood Zone	Number of Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
A01-30 & AE Zones	1,354	$867,782	$321,422,800	1	$6,388
A Zones	0	$0	$0	0	$0
AO Zones	0	$0	$0	0	$0
AH Zones	53	$19,582	$12,781,500	0	$0
AR Zones	0	$0	$0	0	$0
A99 Zones	0	$0	$0	0	$0
V01-30 & VE Zones	0	$0	$0	0	$0
V Zones	0	$0	$0	0	$0
D Zones	0	$0	$0	0	$0
B, C & X Zone	66	$26,166	$19,658,300	1	$37,327
Standard	2	$1,527	$248,300	0	$0
Preferred	64	$24,639	$19,410,000	1	$37,327
Total	**1,473**	**$913,530**	**$353,862,600**	**2**	**$43,715**

Source: FEMA Community Information System, April 2014

Regulated floodplains are illustrated on inundation maps called Digital Flood Insurance Rate Maps (DFIRMs). It is the official map for a community on which FEMA has delineated both the special flood hazard areas (SFHAs) and the risk premium zones applicable to the community. SFHAs represent the areas subject to inundation by the 1-percent-annual chance flood event. Structures located within the SFHA have a 26-percent chance of flooding during the life of a standard 30-year mortgage. Flood zones are geographic areas that FEMA has defined according to varying levels of flood risk and type of flooding. Flood prone areas were identified within the Town of Cutler Bay using the most current Flood Insurance Study (FIS) and associated DFIRMs developed by FEMA and adopted by ordinance on September 11, 2009. Table 3.13 summarizes the flood insurance zones identified by the DFIRMs. Figure 3.11 reflects the mapped flood insurance zones for the Town of Cutler Bay.

Table 3.13 – Mapped Flood Insurance Zones within Cutler Bay

Zone	Description
VE	Also known as the coastal high hazard areas. They are areas subject to high velocity water including waves; they are defined by the 1% annual chance (base) flood limits (also known as the 100-year flood) and wave effects 3 feet or greater. The hazard zone is mapped with base flood elevations (BFEs) that reflect the combined influence of stillwater flood elevations, primary frontal dunes, and wave effects 3 feet or greater.
AE	AE Zones, also within the 100-year flood limits, are defined with BFEs that reflect the combined influence of stillwater flood elevations and wave effects less than 3 feet. The AE Zone generally extends from the landward VE zone limit to the limits of the 100-year flood from coastal sources, or until it reaches the confluence with riverine flood sources. The AE Zones also depict the SFHA due to riverine flood sources, but instead of being subdivided into separate zones of differing BFEs with possible wave effects added, they represent the flood profile determined by

Zone	Description
	hydrologic and hydraulic investigations and have no wave effects.
AH	Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are 1–3 feet. BFEs derived from detailed hydraulic analyses are shown in this zone.
0.2% Annual Chance (shaded Zone X)	Moderate risk areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by a levee. No BFEs or base flood depths are shown within these zones. (Zone X (shaded) is used on new and revised maps in place of Zone B.)
Zone X (unshaded)	Minimal risk areas outside the 1-percent and .2-percent-annual-chance floodplains. No BFEs or base flood depths are shown within these zones. (Zone X (unshaded) is used on new and revised maps in place of Zone C.)

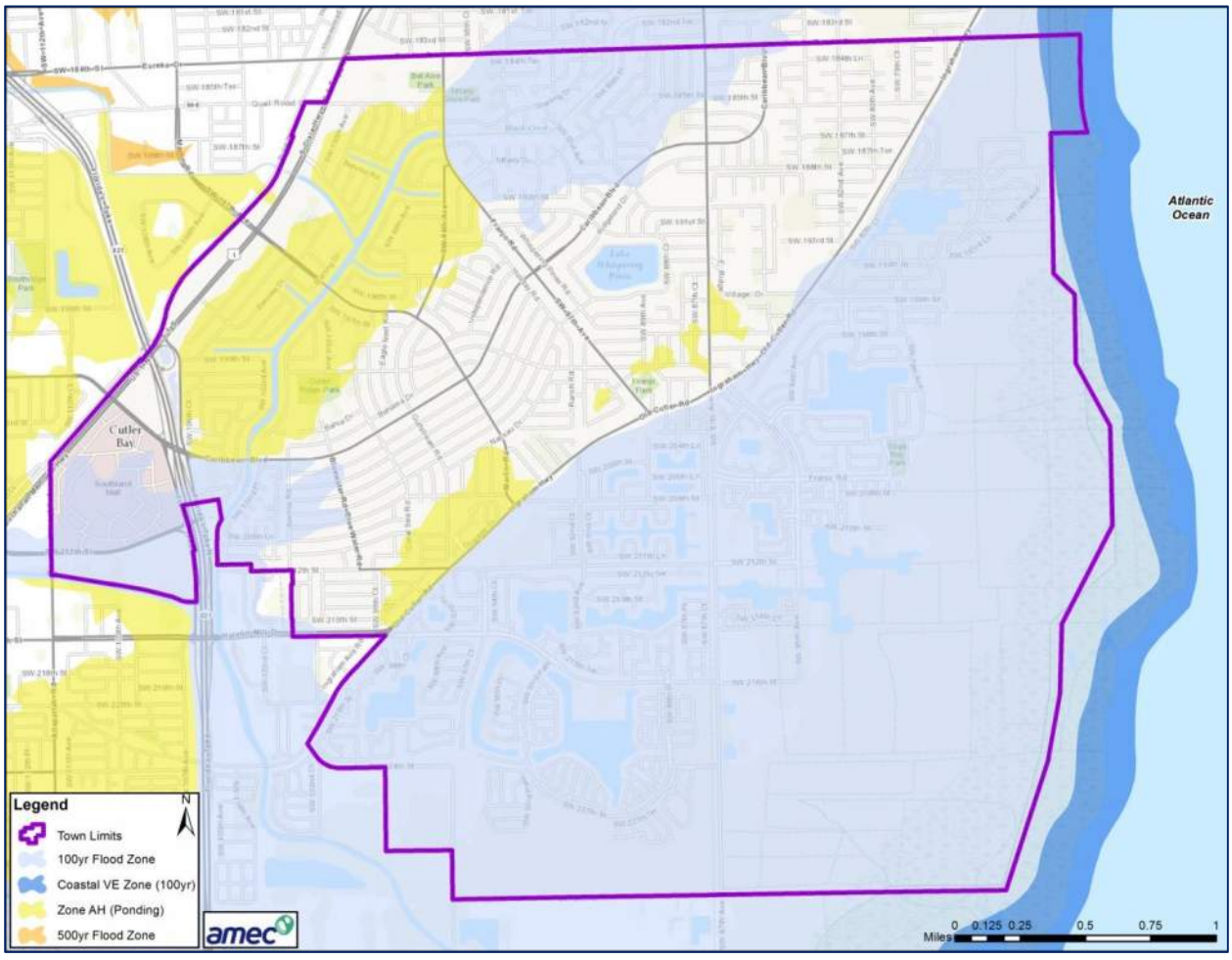


Figure 3.11- Cutler Bay DFIRM Flood Zones

The NFIP utilizes the 100-year flood as a basis for floodplain management. The FIS defines the probability of flooding as flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 100 year period (recurrence intervals). Or considered another way, properties within a 100-year flood zone have a one percent probability of being equaled or exceeded during any

given year. Mortgage lenders require that owners of properties with federally-backed mortgages located within SFHAs purchase and maintain flood insurance policies on their properties. Consequently, newer and recently purchased properties in the community are insured against flooding. Due to the risk of flooding from hurricanes, all property owners in the Town, even if the property is not located in a SFHA, should be encouraged to purchase and maintain flood insurance policies.

Past Occurrences

Miami-Dade County has sustained flood events severe enough to warrant federal disaster declarations as shown in Table 3.3 within Section 3.1.2. Flooding can occur in Cutler Bay year-around but is most frequent in late winter or early spring and again during the summer which are historically the wettest periods of the year. The summer months often bring persistent thunderstorms and in late summer the heavy rains associated with tropical storms and hurricanes are more prevalent. The average annual rainfall for Cutler Bay is 58 to 60 inches. Past occurrences for tropical storms and hurricanes can be found in Section 3.2.6.

Table 3.14 shows the flood events from causes other than hurricanes reported by the NCDC since 1995 for Miami-Dade County. Table 3.15 shows the SHELDUS flood events from causes other than hurricanes from 1960 to 2013.

Table 3.14 - NCDC Flooding in Miami-Dade County - 1995 to October 2013

Location	Date	Event Type	Injuries/Deaths	Damages
E Broward & E Dade	22-Jun-95	Flash Flood	0/0	$1,500,000
Kendell Dr Area	26-Apr-97	Flash Flood	0/0	$0
NE Portion	08-Jun-99	Flash Flood	0/0	$50,000
East Portion	15-Oct-99	Flash Flood	0/0	$100,000,000
North Miami	09-Dec-02	Flash Flood	0/0	$50,000
Kendall	28-Sep-04	Flash Flood	0/0	$50,000
North Miami Beach	20-May-07	Flash Flood	0/0	$5,000
Miami Beach	20-May-07	Flash Flood	0/0	$0
Miami	20-May-07	Flash Flood	0/0	$0
South Miami	05-Jul-07	Flash Flood	0/0	$0
Biscayne Bay Arpt	04-Oct-08	Flash Flood	0/0	$1,000
Ojus	09-Oct-08	Flash Flood	0/0	$10,000
Biscayne Park	05-Jun-09	Flash Flood	0/0	$50,000
Miami Intl Arpt	17-Dec-09	Flash Flood	0/0	$50,000
Miami Beach	04-Jun-10	Flash Flood	0/0	$1,000
Goulds	30-Oct-11	Flash Flood	0/0	$100,000
Homestead	08-Oct-11	Flash Flood	0/0	$0
Florida City	16-Sep-98	Flash Flood	0/0	$0
Miami	14-Apr-00	Flash Flood	0/0	$10,000
Miami	31-May-00	Flash Flood	0/0	$5,000
Hialeah Gardens	22-May-12	Flash Flood	0/0	$0
Hialeah Gardens	22-May-12	Flash Flood	0/0	$75,000
West Miami	30-Apr-13	Flash Flood	0/0	$1,000
North Miami Beach	07-Jun-13	Flash Flood	0/0	$0
Miami Beach	18-Jul-13	Flash Flood	0/0	$5,000
South Miami	02-Oct-13	Flash Flood	0/0	$5,000
Florida City	16-Sep-98	Flood	0/0	$0
Miami	14-Apr-00	Flood	0/0	$10,000
Miami	31-May-00	Flood	0/0	$5,000
Miami	31-Oct-94	Urban Flood	0/0	$50,000
Southern Portion	28-Sep-95	Urban Flood	0/0	$10,000

Location	Date	Event Type	Injuries/Deaths	Damages
Surfside	21-Aug-97	Urban/Small Stream Flood	0/0	$0
Countywide	09-Sep-01	Heavy Rain	0/0	$0
Miami	21-Oct-01	Heavy Rain	0/0	$0
Homestead	06-Nov-03	Heavy Rain	0/0	$0
Hialeah	08-Nov-03	Heavy Rain	0/0	$0
Hialeah	01-Aug-04	Heavy Rain	0/0	$10,000
Opa Locka	02-Aug-04	Heavy Rain	0/0	$40,000
Cutler Ridge	11-Jun-05	Heavy Rain	0/0	$0
North Miami	16-Jun-05	Heavy Rain	0/0	$30,000
Miami	11-Sep-05	Heavy Rain	0/0	$0
Hialeah	15-May-06	Heavy Rain	0/0	$0
Hialeah	16-May-06	Heavy Rain	0/0	$0
South Miami	26-May-06	Heavy Rain	0/0	$0
Opa Locka	02-Sep-06	Heavy Rain	0/0	$100,000
Kendall	16-Nov-06	Heavy Rain	0/0	$20,000
Coral Gables	25-Nov-09	Heavy Rain	0/0	$75,000
Perrine	25-Nov-09	Heavy Rain	0/0	$50,000
Bal Harbour	06-May-11	Heavy Rain	0/0	$0
Miami Intl Arpt	19-Jun-11	Heavy Rain	0/0	$0

Source: NCDC

Table 3.15 - SHELDUS Flooding in Miami-Dade County - 1960 to 2013

Month	Year	Hazard Type	Inj	Deaths	Crop Damage	Property Damage
March	1995	Coastal	1	0	$0.00	$0.00
June	1996	Coastal	0	1	$0.00	$0.00
July	1996	Coastal	0	3	$0.00	$0.00
June	1998	Coastal	1	1	$0.00	$0.00
May	1999	Coastal	0	1	$0.00	$0.00
October	1999	Coastal	2	2	$0.00	$0.00
January	2000	Coastal	1	0	$0.00	$0.00
February	2001	Coastal	1	0	$0.00	$0.00
April	2001	Coastal	1	1	$0.00	$0.00
May	2002	Coastal	0	1	$0.00	$0.00
July	2002	Coastal	1	1	$0.00	$0.00
August	2002	Coastal	0	1	$0.00	$0.00
August	2003	Coastal	0	1	$0.00	$0.00
November	2003	Coastal	0	1	$0.00	$0.00
May	2004	Coastal	3	3	$0.00	$0.00
November	2005	Coastal	1	1	$0.00	$0.00
May	2007	Coastal	2	1	$0.00	$0.00
November	2007	Coastal	1	0	$0.00	$1,498,053.00
November	2010	Coastal	1	0	$0.00	$0.00
April	2012	Coastal	0	0	$0.00	$0.00
August	2013	Coastal	0	1	$0.00	$0.00
October	1974	Flooding	0	0	$656.00	$65,629.00
October	1991	Flooding	0	0	$0.00	$42,760.00
June	1995	Flooding	0	0	$0.00	$1,146,441.00
September	1995	Flooding	0	0	$0.00	$15,285.00
June	1999	Flooding	0	0	$0.00	$69,915.00
October	1999	Flooding	0	0	$279,660,265.00	$139,830,132.00

Month	Year	Hazard Type	Inj	Deaths	Crop Damage	Property Damage
April	2000	Flooding	0	0	$0.00	$13,528.00
May	2000	Flooding	0	0	$0.00	$6,764.00
October	2000	Flooding	0	0	$338,207,027.00	$304,386,324.00
December	2000	Flooding	0	0	$17,586,765.00	$135,282.00
December	2002	Flooding	0	0	$0.00	$64,746.00
September	2004	Flooding	0	0	$0.00	$61,661.00
May	2007	Flooding	0	0	$0.00	$5,617.00
October	2008	Flooding	0	0	$0.00	$11,901.00
June	2009	Flooding	0	0	$0.00	$54,292.00
December	2009	Flooding	0	0	$0.00	$54,292.00
June	2010	Flooding	0	0	$0.00	$1,068.00
October	2011	Flooding	0	0	$0.00	$103,564.00
May	2012	Flooding	0	0	$0.00	$76,098.00
April	2013	Flooding	0	0	$0.00	$1,000.00
July	2013	Flooding	0	0	$0.00	$5,000.00
October	2013	Flooding	0	0	$0.00	$5,000.00
January	1969	Severe Storm/Thunder Storm	0	0	$0.00	$3,173.00
February	1969	Severe Storm/Thunder Storm	0	0	$0.00	$15,632.00
May	1977	Severe Storm/Thunder Storm	0	0	$192,208.00	$0.00
June	1991	Severe Storm/Thunder Storm	0	0	$0.00	$85.00
November	2003	Severe Storm/Thunder Storm	0	0	$253,214.00	$0.00
February	2004	Severe Storm/Thunder Storm	0	0	$0.00	$184,984.00
August	2004	Severe Storm/Thunder Storm	0	0	$0.00	$61,661.00
June	2005	Severe Storm/Thunder Storm	0	0	$0.00	$35,784.00
September	2006	Severe Storm/Thunder Storm	0	0	$0.00	$115,554.00
November	2006	Severe Storm/Thunder Storm	0	0	$0.00	$23,110.00
November	2009	Severe Storm/Thunder Storm	0	0	$0.00	$135,732.00

Source: SHELDUS, September 2014

The following provides details on flood events detailed in the NCDC database and from members of the FMPC.

October 2, 2013 - Persistent heavy rains from slow moving showers and thunderstorms produced an isolated area of flash flooding during the late afternoon and early evening. Measured rainfall amounts were in the range of 7 to 10 inches in a matter of just a few hours.

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

October 8, 2011 - Heavy and persistent showers led to flooding over southwestern metro Miami-Dade County. Total rainfall amounts in this area ranged from 5 to 9 inches, with most of this rain falling in a 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.

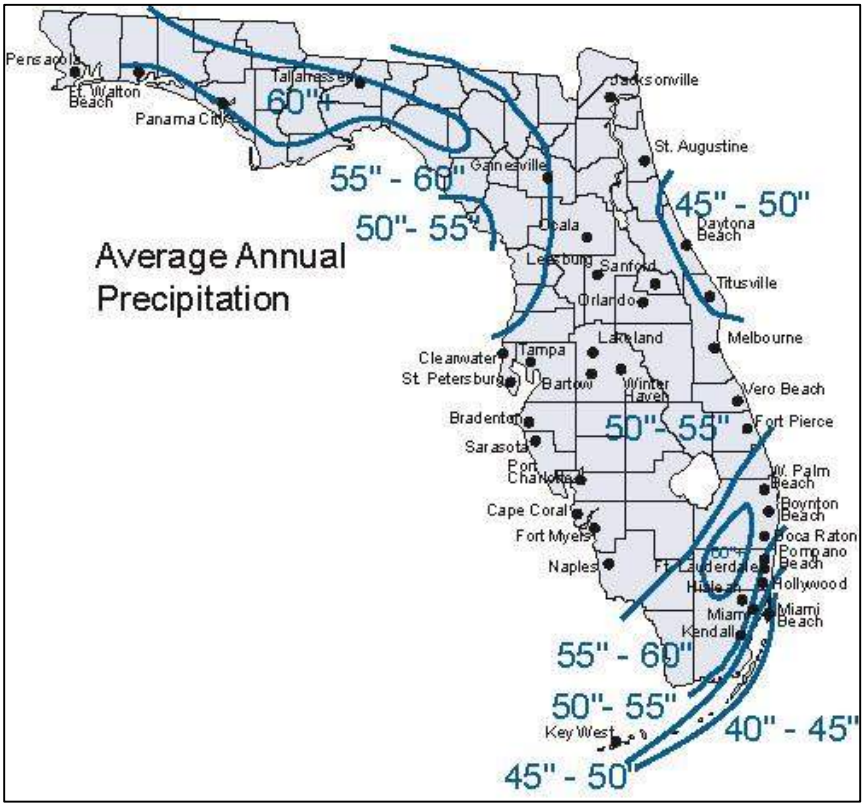
September 9-12, 2001 - A stalled trough of low pressure across north Florida gradually shifted to south Florida and eventually spawned tropical storm Gabrielle in the east Gulf of Mexico. Before becoming Gabrielle 5 to 10 inches of rain fell across southeast Florida, causing widespread street flooding.

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.

April 26, 1997 – Twelve inches of rain feel over the area near Kendall Drive and Don Shula Expressway with widespread areas of five to 10 inches of rain. Canals overflowed, water levels entered buildings and numerous vehicles stalled in water.

Frequency/Likelihood of Future Occurrence

Likely - By definition of the 1-percent-annual-chance flood event, the Town of Cutler Bay has a 1 percent chance of a 100-year or significant flood being equaled or exceeded in any given year. As shown in Figure 3.12, the annual precipitation for Cutler Bay averages 58 to 60 inches. A similar amount of precipitation should be anticipated in the future, and occasional flooding is likely to occur.



Source: Florida Climate Center, Florida State University

Figure 3.12 - Average Annual Precipitation for Florida

The depth of flooding from a 100-year (1% annual chance flood) will range from 0 feet to more than 10 feet. This is shown in Figure 3.26 in Section 3.3.4.

Climate Change and Flood: 100-/500-year

With its populous coastal community, porous geology and low topography, Cutler Bay is particularly vulnerable to the effects of climate change and sea level rise. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase which can overwhelm stormwater drainage systems. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events.

3.2.5 Flood: Stormwater/Localized Flooding

Hazard/Problem Description

Localized stormwater flooding can also occur throughout Cutler Bay. Localized stormwater flooding occurs when heavy rainfall and an accumulation of runoff overburden the stormwater drainage system within the community. Cutler Bay is located along the Atlantic Ocean and Biscayne Bay, and the topography of the area is very flat with elevations generally below 10 feet (NGVD 29). Flooding problems are presented by ponding in the very flat, poorly drained areas and by overflow from the drainage canals that traverse the Town. Stormwater drainage has been an on-going challenge in the Town, particularly the areas of marl and muck soils east of Old Cutler Road.

As shown in Figure 3.13, there are six major canals that lie within and/or border the Town of Cutler Bay: C-100, C100B, C-1, C-1N, C-1W and L31E. These canals provide three main functions:

- To provide drainage and flood protection.
- To supply water for irrigation.
- To maintain a groundwater table elevation that is adequate to prevent saltwater intrusion into local groundwater.

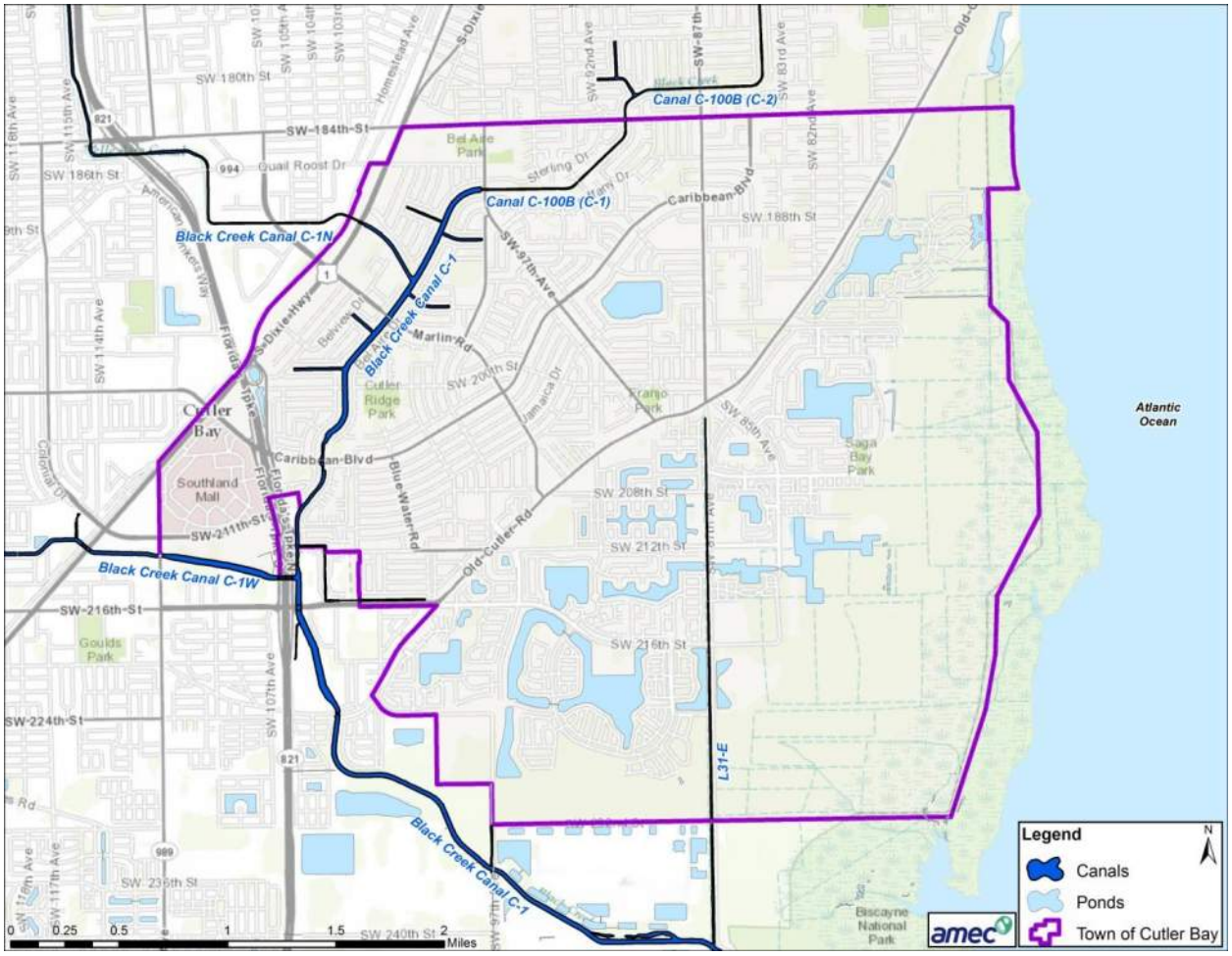


Figure 3.13 - Cutler Bay Canal System

Past Occurrences

Localized stormwater flooding can be associated with a 100-year (1% annual chance flood) and the depth of flooding is often 3 feet which is consistent with AH Zones shown in much of Cutler Bay. Details of past occurrences for localized stormwater flooding are detailed in Section 3.2.4. This is shown in Figure 3.26 in Section 3.3.4. Areas of local stormwater flooding were identified by the FMPC. Figure 3.14 depicts the areas of localized flooding identified by the FMPC. The areas of localized flooding include:

- Sterling Dr and SW 93 St
- Parcels between SW 195 St and SW 196 St
- The parcels bordered by Caribbean Blvd, Anchor Rd, Pan American Dr and Blue Water Rd
- Manta Drive at Old Cutler Rd
- Old Cutler Rd southwest of the intersection of Franjo Rd
- The intersection of SW 89 Ct, Franjo Rd and SW 200 St
- SW 186 St at SW 97th Avenue
- SW 77 Ave and SW 188 St through the intersection of SW 78 Ave
- SW 79 Ave at SW 79 Ct
- SW 197 Terrace at SW 196 Terrace
- SW 84 Ave at SW 199 Terrace
- SW 212 St between SW 85 Ave and SW 87 Ave

- SW 92 Ave between Old Cutler Road and SW 208 St
- SW 24 Terrace between SW 97 Ct and SW 97 Pl
- SW 216 St between SW 97 Ave and SW 98 Ct
- SW 97 Ave between SW 219 St and SW 224 St
- The quadrant of parcels bordered by SW 97 Ave, SW 221 Street/Terrace, SW 99 Pl and SW 224 St
- The intersection of SW 92 Ave/SW 93 Path and SW 216 St
- Parcels between SW 216 St and the eastern portion of SW 215 Terrace
- SW 216 St between SW 87 Pl and SW 88 Pl

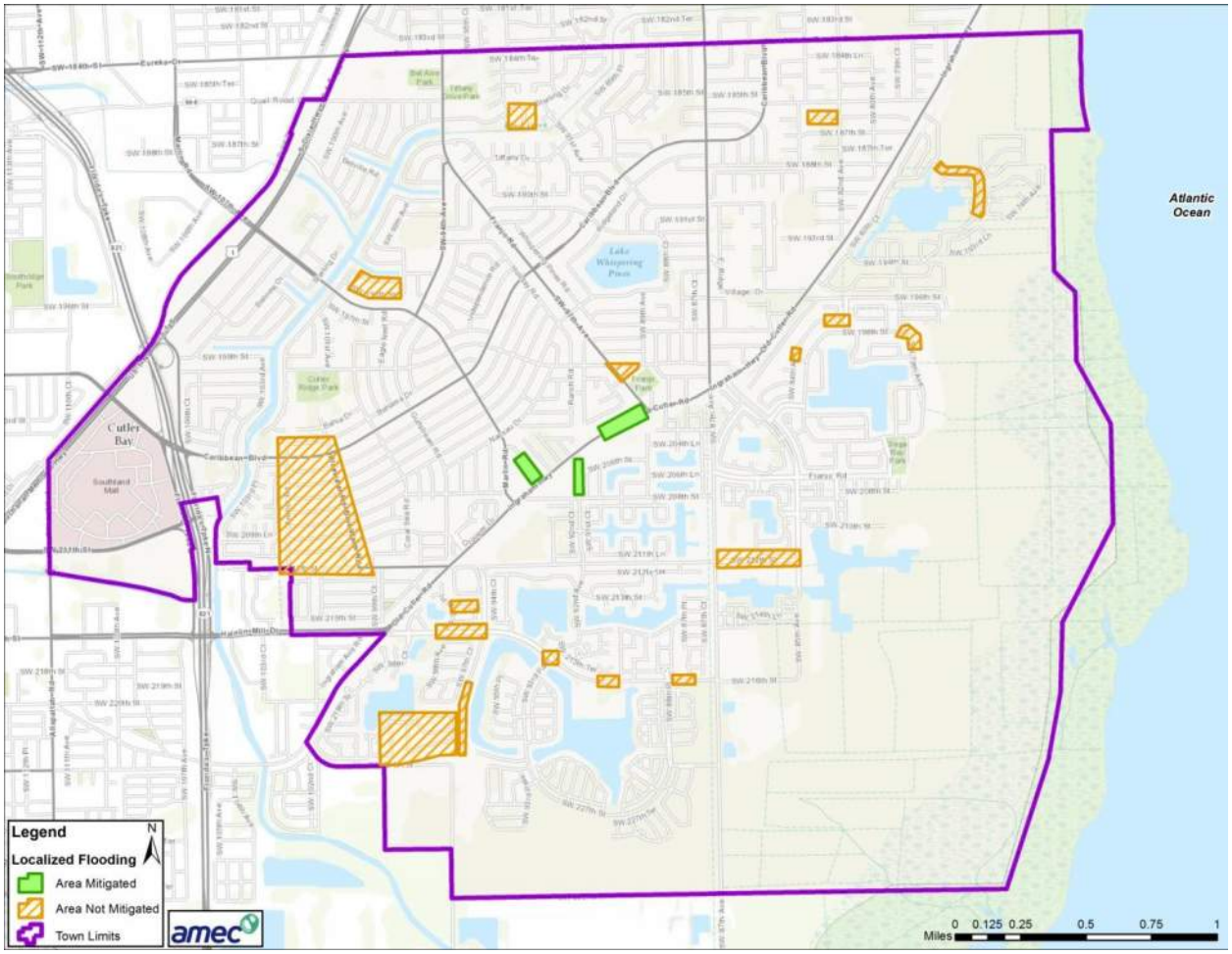


Figure 3.14 - Localized Flooding Identified by the FMPC

Localized flooding may be caused by the following maintenance related issues:

Clogged Inlets – debris covering the asphalt apron and the top of grate at catch basin inlets may contribute to an inadequate flow of stormwater into the system which may cause flooding near the structure. Debris within the basin itself may also reduce the efficiency of the system by reducing the carrying capacity.

Blocked Drainage Outfalls – debris blockage or structural damage at drainage outfalls may prevent the system from discharging runoff which may lead to a back-up of stormwater within the system.

SW 216th St and 97th Ave

Improper Grade – poorly graded asphalt around catch basin inlets may prevent stormwater from entering the catch basin as designed. Areas of settled asphalt may create low spots within the roadway that allow for areas of ponded water.

Catalina Subdivision

Frequency/Likelihood of Future Occurrence

Highly Likely **-** Due to the low elevations, a flat terrain, a consistent level of annual precipitation and the tidal influence on canal drainage resulting from heavy rainstorms, tropical storms, and hurricanes, it is highly likely that unmitigated properties will continue to experience localized flooding.

Climate Change and Flood: Stormwater/Localized Flooding

Climate change and sea level rise do have the potential to affect localized flooding in Cutler Bay. The intensity of individual rainfall events is likely to increase which can overwhelm stormwater drainage systems. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events.

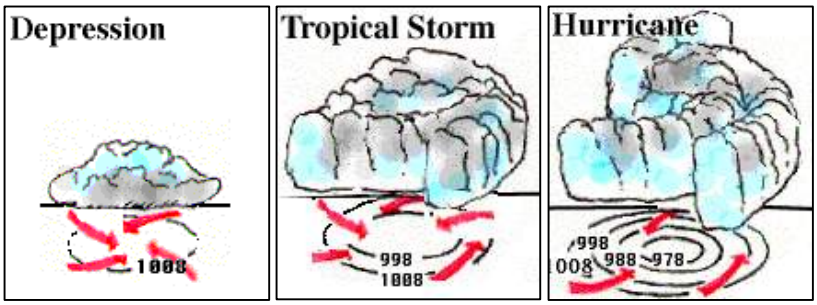
3.2.6 Hurricane and Tropical Storm (including Storm Surge)

Hazard/Problem Description

A hurricane is a type of tropical cyclone or severe tropical storm that forms in the southern Atlantic Ocean, Caribbean Sea, Gulf of Mexico, and in the eastern Pacific Ocean. A typical cyclone is accompanied by thunderstorms, and in the Northern Hemisphere, a counterclockwise circulation of winds near the earth's surface. All Atlantic and Gulf of Mexico coastal areas are subject to hurricanes. The Atlantic hurricane season lasts from June to November, with the peak season from mid-August to late October.

Hurricanes evolve through a life cycle of stages from birth to death. A tropical disturbance can grow to a more intense stage through an increase in sustained wind speeds. The progression of a tropical disturbance is described below and can be seen in Figure 3.15.

- **Tropical Depression:** A tropical cyclone with maximum sustained winds of 38 mph (33 knots) or less.
- **Tropical Storm:** A tropical cyclone with maximum sustained winds of 39 to 73 mph (34 to 63 knots).
- **Hurricane:** A tropical cyclone with maximum sustained winds of 74 mph (64 knots) or higher. In the western North Pacific, hurricanes are called typhoons; similar storms in the Indian Ocean and South Pacific Ocean are called cyclones.
- **Major Hurricane:** A tropical cyclone with maximum sustained winds of 111 mph (96 knots) or higher, corresponding to a Category 3, 4 or 5 on the Saffir-Simpson Hurricane Wind Scale.



Source: Department of Atmospheric Sciences at the University of Illinois at Urbana-Champaign

Figure 3.15 - Life Cycle of a Hurricane

Tropical Storm

Tropical depressions and tropical storms are both categorized by the National Weather Service as a tropical cyclone. The differentiation between these two is wind speed and organization:

Tropical Depression - a tropical cyclone in which the maximum 1-minute sustained surface wind is 33 knots (38 mph) or less. When viewed from a satellite, tropical depressions appear to have little organization. However, the slightest amount of rotation can usually be perceived when looking at a series of satellite images. Instead of a round appearance similar to hurricanes, tropical depressions look like individual thunderstorms that are grouped together.

Tropical Storm - a tropical cyclone in which the maximum 1-minute sustained surface wind ranges from 34 to 63 knots (39 to 73 mph) inclusive. As the storm transitions from tropical depression to tropical storm, the storm itself becomes more organized and begins to become more circular in shape - resembling a hurricane.

While hurricanes pose the greatest threat to life and property, tropical storms and depressions also can be devastating. Floods from heavy rains and severe weather, such as tornadoes, can cause extensive damage and loss of life. Tables 3.17 and 3.18 show the tropical storms that have impacted Miami-Dade County as reported by the NCDC and SHELDUS, respectively.

Hurricane

A hurricane is a tropical cyclone in which the maximum sustained surface wind is 74 mph or more. Hurricanes are classified by intensity into one of five categories on the Saffir-Simpson Hurricane Wind Scale as shown in Table 3.16, and Cutler Bay can potentially expect a category 5 hurricane. 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. Category 1 and 2 storms are still dangerous, however, and require preventative measures.

Table 3.16 – Saffir-Simpson Hurricane Wind Scale, 2012

Category	Wind Speed (mph)	Potential Damage
1	74-95	**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	**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	111-129	**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	130-156	**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	$\geq$ 157	**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

Wind speed is the determining factor in the scale, as storm surge values are highly dependent on the slope of the continental shelf and the shape of the coastline in the landfall region. The following describes the characteristics of each category storm from the Saffir-Simpson Hurricane Wind Scale Extended Table:

Category 1 Hurricane - Winds 74 – 95 mph. Very dangerous winds will produce some damage. People, livestock, and pets struck by flying or falling debris could be injured or killed. Older (mainly pre-1994 construction) mobile homes could be destroyed, especially if they are not anchored properly as they tend to shift or roll off their foundations. Newer mobile homes that are anchored properly can sustain damage involving the removal of shingle or metal roof coverings, and loss of vinyl siding, as well as damage to carports, sunrooms, or lanais. Some poorly constructed frame homes can experience major damage, involving loss of the roof covering and damage to gable ends as well as the removal of porch coverings and awnings. Unprotected windows may break if struck by flying debris. Masonry chimneys can be toppled. Well-constructed frame homes could have damage to roof shingles, vinyl siding, soffit panels, and gutters. Failure of aluminum, screened-in, swimming pool enclosures can occur. Some apartment building and shopping center roof coverings could be partially removed. Industrial buildings can lose roofing and siding especially from windward corners, rakes, and eaves. Failures to overhead doors and unprotected windows will be common. Windows in high-rise buildings can be broken by

flying debris. Falling and broken glass will pose a significant danger even after the storm. There will be occasional damage to commercial signage, fences, and canopies. Large branches of trees will snap and shallow rooted trees can be toppled. Extensive damage to power lines and poles will likely result in power outages that could last a few to several days.

Category 2 Hurricane - Winds 96-110 mph. Extremely dangerous winds will cause extensive damage. There is a substantial risk of injury or death to people, livestock, and pets due to flying and falling debris. Older (mainly pre-1994 construction) mobile homes have a very high chance of being destroyed and the flying debris generated can shred nearby mobile homes. Newer mobile homes can also be destroyed. Poorly constructed frame homes have a high chance of having their roof structures removed especially if they are not anchored properly. Unprotected windows will have a high probability of being broken by flying debris. Well-constructed frame homes could sustain major roof and siding damage. Failure of aluminum, screened-in, swimming pool enclosures will be common. There will be a substantial percentage of roof and siding damage to apartment buildings and industrial buildings. Unreinforced masonry walls can collapse. Windows in high-rise buildings can be broken by flying debris. Falling and broken glass will pose a significant danger even after the storm. Commercial signage, fences, and canopies will be damaged and often destroyed. 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. Potable water could become scarce as filtration systems begin to fail.

Category 3 Hurricane - Winds 111-129 mph. Devastating damage will occur. There is a high risk of injury or death to people, livestock, and pets due to flying and falling debris. Nearly all older (pre-1994) mobile homes will be destroyed. Most newer mobile homes will sustain severe damage with potential for complete roof failure and wall collapse. Poorly constructed frame homes can be destroyed by the removal of the roof and exterior walls. Unprotected windows will be broken by flying debris. Well-built frame homes can experience major damage involving the removal of roof decking and gable ends. There will be a high percentage of roof covering and siding damage to apartment buildings and industrial buildings. Isolated structural damage to wood or steel framing can occur. Complete failure of older metal buildings is possible, and older unreinforced masonry buildings can collapse. Numerous windows will be blown out of high-rise buildings resulting in falling glass, which will pose a threat for days to weeks after the storm. Most commercial signage, fences, and canopies will be destroyed. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to a few weeks after the storm passes.

Category 4 Hurricane - Winds 130 to 156 mph. Catastrophic damage will occur. There is a very high risk of injury or death to people, livestock, and pets due to flying and falling debris. Nearly all older (pre-1994) mobile homes will be destroyed. A high percentage of newer mobile homes also will be destroyed. Poorly constructed homes can sustain complete collapse of all walls as well as the loss of the roof structure. Well-built homes also can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Extensive damage to roof coverings, windows, and doors will occur. Large amounts of windborne debris will be lofted into the air. Windborne debris damage will break most unprotected windows and penetrate some protected windows. There will be a high percentage of structural damage to the top floors of apartment buildings. Steel frames in older industrial buildings can collapse. There will be a high percentage of collapse to older unreinforced masonry buildings. Most windows will be blown out of high-rise buildings resulting in falling glass, which will pose a threat for days to weeks after the storm. Nearly all commercial signage, fences, and canopies will be destroyed. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Long-term water shortages will increase human suffering. Most of the area will be uninhabitable for weeks or months.

Category 5 Hurricane - Winds 157 mph or higher. Catastrophic damage will occur. People, livestock, and pets are at very high risk of injury or death from flying or falling debris, even if indoors in mobile homes or framed homes. Almost complete destruction of all mobile homes will occur, regardless of age or construction. A high percentage of frame homes will be destroyed, with total roof failure and wall collapse. Extensive damage to roof covers, windows, and doors will occur. Large amounts of windborne debris will be lofted into the air. Windborne debris damage will occur to nearly all unprotected windows and many protected windows. Significant damage to wood roof commercial buildings will occur due to loss of roof sheathing. Complete collapse of many older metal buildings can occur. Most unreinforced masonry walls will fail which can lead to the collapse of the buildings. A high percentage of industrial buildings and low-rise apartment buildings will be destroyed. Nearly all windows will be blown out of high-rise buildings resulting in falling glass, which will pose a threat for days to weeks after the storm. Nearly all commercial signage, fences, and canopies will be destroyed. Nearly all trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Long-term water shortages will increase human suffering. Most of the area will be uninhabitable for weeks or months. Hurricane Andrew (1992) is an example of a hurricane that brought Category 5 winds and impacts to coastal portions of Cutler Ridge, Florida with Category 4 conditions experienced elsewhere in south Miami-Dade County.

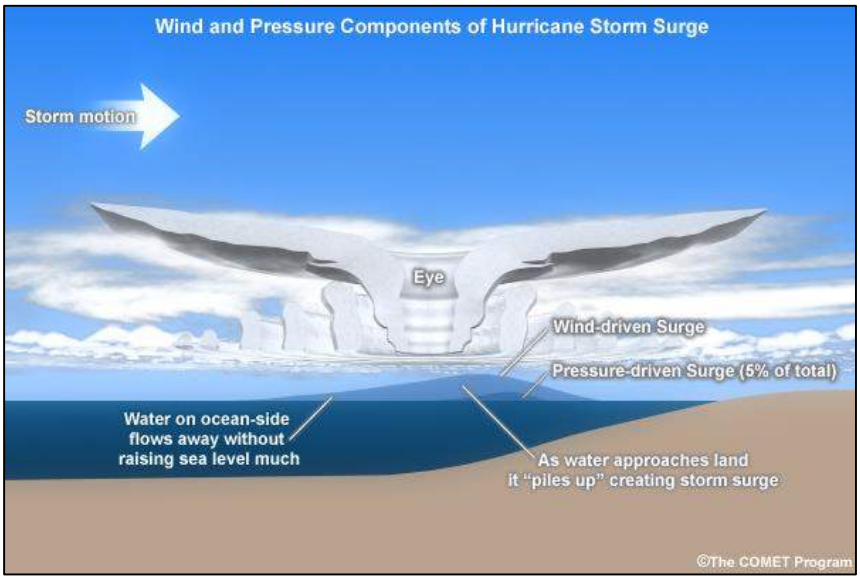
Hurricanes can cause catastrophic damage to coastlines and several hundred miles inland. Hurricanes can produce winds exceeding 157 miles per hour as well as tornadoes and mircrobursts. Additionally, hurricanes can create storm surges along the coast and cause extensive damage from heavy rainfall. Floods and flying debris from the excessive winds are often the deadly and destructive results of these weather events. Flash flooding can also occur due to intense rainfall.

Storm Surge

The greatest potential for loss of life related to a hurricane is from the storm surge. Storm surge is simply water that is pushed toward the shore by the force of the winds swirling around the storm as shown in Figure 3.16. This advancing surge combines with the normal tides to create the hurricane storm tide, which can increase the mean water level to heights impacting roads, homes and other critical infrastructure. In addition, wind driven waves are superimposed on the storm tide. This rise in water level can cause severe flooding in coastal areas, particularly when the storm tide coincides with the normal high tides. Because much of the densely populated Atlantic coastline lies less than 10 feet above mean sea level, the danger from storm tides is tremendous.

The storm surge combined with wave action can cause extensive damage, severely erode beaches and coastal highways. With major storms like Katrina, Camille and Hugo, complete devastation of coastal communities occurred. Many buildings withstand hurricane force winds until their foundations, undermined by erosion, are weakened and fail. The combination of storm tides, waves and currents can also damage marinas and boats. In estuaries, salt water intrusion endangers public health, kills vegetation, and can send animals such as snakes and alligators fleeing from flooded areas.

The maximum potential storm surge for a particular location depends on a number of different factors. Storm surge is a very complex phenomenon because it is sensitive to the slightest changes in storm intensity, forward speed, size (radius of maximum winds-RMW), angle of approach to the coast, central pressure (minimal contribution in comparison to the wind), and the shape and characteristics of coastal features such as bays and estuaries. Other factors which can impact storm surge are the width and slope of the continental shelf. A shallow slope will potentially produce a greater storm surge than a steep shelf. For example, a Category 4 storm hitting the Louisiana coastline, which has a very wide and shallow continental shelf, may produce a 20-foot storm surge, while the same hurricane in Miami Beach, Florida, where the continental shelf drops off very quickly, might see an 8 or 9-foot surge.



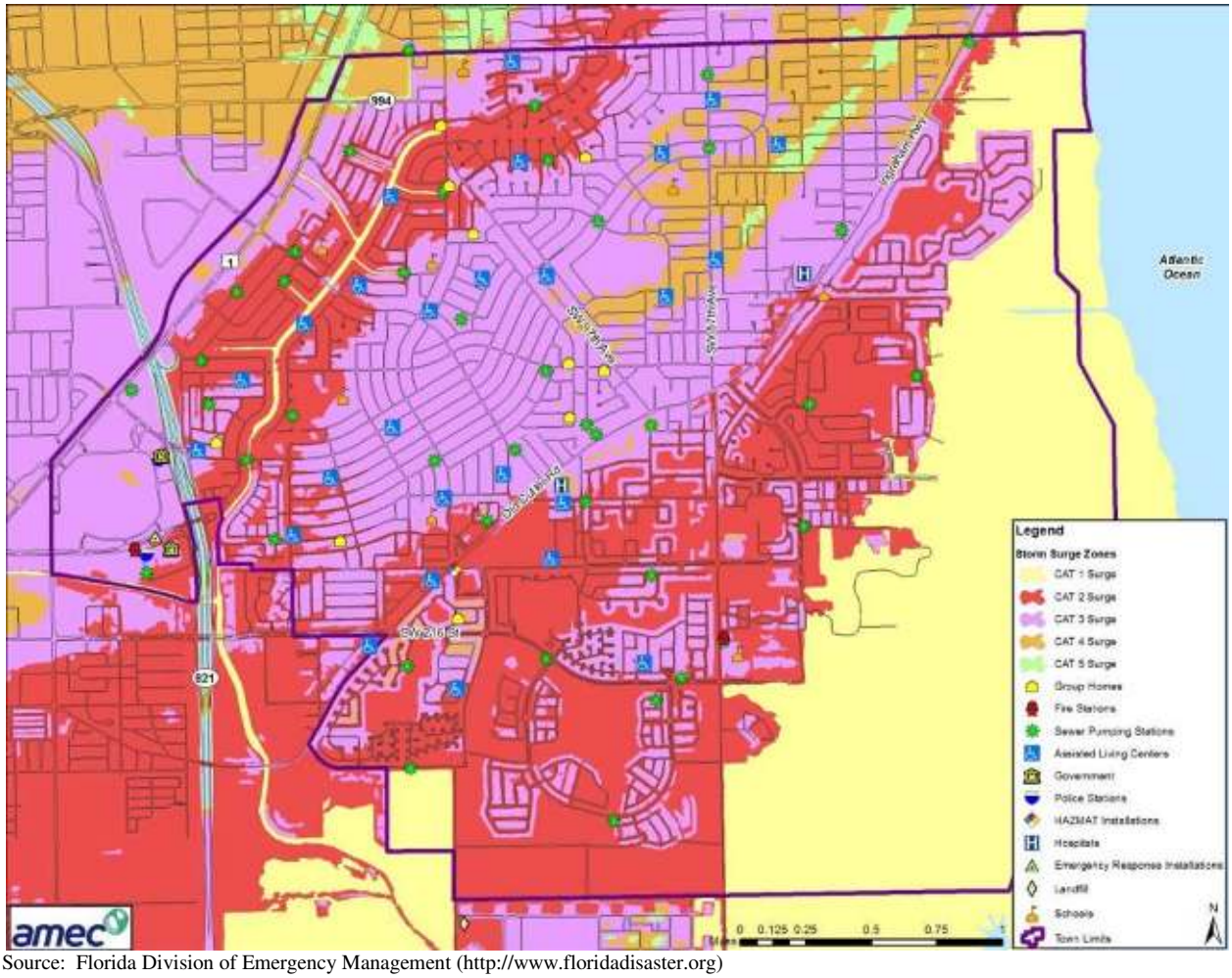
Source: NOAA/The COMET Program

Figure 3.16 - Components of Hurricane Storm Surge

Storm Surge Mapping

The Sea, Lake and Overland Surges from Hurricanes (SLOSH) model is a computerized numerical model developed by the National Weather Service (NWS) to estimate storm surge heights resulting from historical, hypothetical, or predicted hurricanes by taking into account the atmospheric pressure, size, forward speed, and track data. These parameters are used to create a model of the wind field which drives the storm surge. The SLOSH model consists of a set of physics equations which are applied to a specific locale's shoreline, incorporating the unique bay and river configurations, water depths, bridges, roads, levees and other physical features.

Anticipated SLOSH model surge elevations for Category 1-5 hurricanes are shown for Cutler Bay in Figure 3.17. The feature set depicting surge zones in this figure was created using a Surge Modeling application created for the Florida Statewide Regional Evacuation Update Study. The data was derived from National Hurricane Center SLOSH model runs on all the NOAA SLOSH basins throughout Florida. The runs create outputs for all different storm simulations from all points of the compass. Each direction has a MEOW (maximum envelope of water) for each category of storm (1-5), and all directions combined result in a MOMs (maximum of maximums) set of data. The MOMs are used in this surge model.



Source: Florida Division of Emergency Management (http://www.floridadisaster.org)

Figure 3.17 – Category 1 through Category 5 Storm Surge Zones for Cutler Bay

Past Occurrences

The following is a description of past occurrences of hurricanes and tropical storms from the Miami-Dade County Local Mitigation Strategy (LMS) and NCDC. Table 3.17 shows hurricane and tropical storm data reported by NCDC since 1950 for Miami-Dade County. Table 3.18 shows SHELDUS events related to hurricanes and tropical storms from 1960 to 2012. Table 3.19 shows storm surge data reported by NCDC since 1950 for Miami-Dade County. Major disaster declarations for hurricanes and tropical storms in Miami-Dade County can be found in Table 3.3. Figure 3.18 reflects past track maps of U.S. land falling major hurricanes as provided by the National Hurricane Center.

October 1999 - Hurricane Irene (DR-1306) developed and started a path towards south Florida. Initial projections were correct in stating the hurricane would impact the west coast of Florida, and Irene traveled through the state and, on October 15, passed just to the west of Miami-Dade County. Although the hurricane did not pass directly through the county and no exceptionally high winds were experienced, the heavy rainfall associated with this storm did hit Miami-Dade County, and the impacts were severe. Some roads were impassible for weeks, electricity was out in certain areas, and residents and businesses suffered heavy losses.

October 2000 - a low-pressure system, later to become Tropical Storm Leslie, developed off the west coast of Cuba, and headed toward South Florida (DR-1345). Water managers and weather officials

closely tracked the storm, and preemptive measures were taken to start moving water out of the canals. Once the storm passed over south Florida, it exploded, dumping 14 to18 inches of rainfall over a linear area in the center of Miami-Dade County.

September 2004 - Hurricane Jeanne formed from a tropical depression just east of the Leeward Islands on September 13. She moved across Puerto Rico and Hispaniola then turned north into the Atlantic and became a hurricane on September 20. Property damage from storm surge and winds at the coast occurred to condos, marinas, piers, seawalls, bridges and docks, as well as to boats and a few coastal roadways.

August 2005 - Hurricane Katrina was every bit as much a flood event as it was a windstorm. Rainfall amounts were excessive across portions of south Miami-Dade County causing flooding of structures, vehicles, crop lands and nurseries. A maximum storm total amount of 16.33 inches, of which 15.10 inches fell in a 24-hour period, was measured by a cooperative observed in Perrine. Other heavy storm total amounts in south Miami-Dade County included 14.04 inches at Homestead Air Reserve Base, 12.25 inches near Florida City and 11.13 inches near Cutler Ridge.

Table 3.17 - NCDC Hurricane/Tropical Storm Data for Miami-Dade County, 1950-2013

Location	Date	Event Type	Deaths/ Injuries	Property Damage	Crop Damage
Miami-Dade Coastal Zone	07/10/1996	Hurricane	2/0	$0	$0
Miami-Dade Coastal Zone	09/25/1998	Hurricane	0/0	$5,000,000	$15,000,000
Miami-Dade Coastal Zone	09/13/1999	Hurricane	0/0	$0	$0
Miami-Dade Coastal Zone	10/14/1999	Hurricane	0/0	$140,000,000	$230,000,000
Miami-Dade Coastal Zone	11/05/2001	Hurricane	0/0	$10,000	$0
Miami-Dade Coastal Zone	09/04/2004	Hurricane	0/0	$34,000,000	$0
Miami-Dade Coastal Zone	09/25/2004	Hurricane	0/0	$10,000,000	$0
Miami-Dade Coastal Zone	07/08/2005	Hurricane	0/0	$0	$0
Miami-Dade Coastal Zone	08/25/2005	Hurricane	6/0	$64,000,000	$423,000,000
Miami-Dade Coastal Zone	10/24/2005	Hurricane	2/0	$0	$0
Miami-Dade Coastal Zone	9/24/1998	Tropical Storm	0/0	$0	$0
Miami-Dade Coastal Zone	9/25/1998	Tropical Storm	0/0	$0	$0
Miami-Dade Coastal Zone	11/4/1998	Tropical Storm	0/0	$0	$0
Miami-Dade Coastal Zone	11/4/1998	Tropical Storm	0/0	$0	$0
Miami-Dade Coastal Zone	9/20/1999	Tropical Storm	0/0	$0	$0
Miami-Dade Coastal Zone	9/20/2005	Tropical Storm	0/0	$0	$0
Miami-Dade	8/29/2006	Tropical Storm	0/0	$0	$0

Location	Date	Event Type	Deaths/ Injuries	Property Damage	Crop Damage
Coastal Zone					
Miami-Dade Coastal Zone	8/29/2006	Tropical Storm	0/0	$0	$0
Miami-Dade Coastal Zone	10/30/2007	Tropical Storm	0/0	$0	$0
Miami-Dade Coastal Zone	8/18/2008	Tropical Storm	0/0	10,000	
Miami-Dade Coastal Zone	8/18/2008	Tropical Storm	0/0	$0	$0
Miami-Dade Coastal Zone	8/18/2008	Tropical Storm	0/0	$0	$0
Miami-Dade Coastal Zone	8/18/2008	Tropical Storm	0/0	$0	$0
Miami-Dade Coastal Zone	9/8/2008	Tropical Storm	0/0	$0	$0
Miami-Dade Coastal Zone	9/8/2008	Tropical Storm	0/0	$0	$0
Miami-Dade Coastal Zone	9/8/2008	Tropical Storm	0/0	$0	$0
Miami-Dade Coastal Zone	7/23/2010	Tropical Storm	0/0	2,000	
Miami-Dade Coastal Zone	8/26/2012	Tropical Storm	0/0	$0	$0
Miami-Dade Coastal Zone	8/26/2012	Tropical Storm	0/0	$0	$0
Miami-Dade Coastal Zone	8/26/2012	Tropical Storm	0/0	100,000	$0
Miami-Dade Coastal Zone	10/25/2012	Tropical Storm	0/0	$0	$0
			Total:	**$253,122,000**	**$668,000,000**

Source: NCDC, April 2014

Table 3.18- SHELDUS Hurricane/Tropical Storm Data for Miami-Dade County - 1960 to 2013

Month	Year	Hazard Type	Injuries	Fatalities	Crop Damage	Property Damage
August	1964	Hurricane/Tropical Storm	0	0	$2,504,913.00	$25,049,139.00
October	1964	Hurricane/Tropical Storm	2	0	$0.00	$1,633,639.00
September	1965	Hurricane/Tropical Storm	0	0	$0.00	$10,875,677.00
June	1966	Hurricane/Tropical Storm	0	0	$0.00	$678,304.00
October	1966	Hurricane/Tropical Storm	4	2	$513,573.00	$513,573.00
June	1968	Hurricane/Tropical Storm	0	0	$0.00	$8,163,617.00
October	1968	Hurricane/Tropical Storm	0	0	$0.00	$643,669.00
June	1972	Hurricane/Tropical Storm	1	0	$415.00	$83,181.00
September	1979	Hurricane/Tropical Storm	0	0	$348,779.00	$3,487,797.00
August	1981	Hurricane/Tropical Storm	0	0	$985,685.00	$98,568.00
August	1985	Hurricane/Tropical Storm	0	0	$0.00	$161,569.00
October	1987	Hurricane/Tropical Storm	0	0	$0.00	$14,647.00
August	1992	Hurricane/Tropical Storm	0	3	$415,105,133.00	$10,377,628,331.00
November	1994	Hurricane/Tropical Storm	0	2	$3,274,806.00	$3,274,806.00
August	1995	Hurricane/Tropical Storm	0	0	$218,369.00	$131,021.00
July	1996	Hurricane/Tropical Storm	0	2	$0.00	$0.00

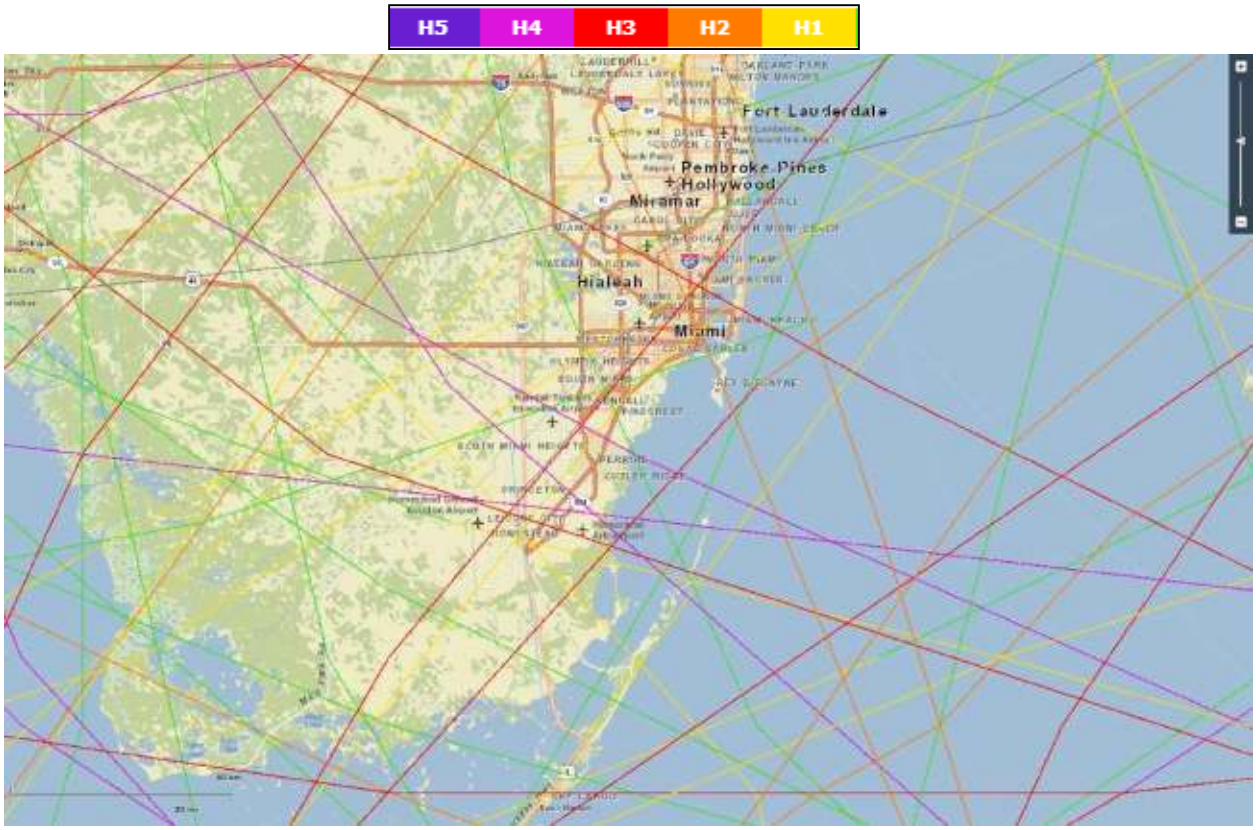
Month	Year	Hazard Type	Injuries	Fatalities	Crop Damage	Property Damage
September	1998	Hurricane/Tropical Storm	0	0	$10,718,880.00	$182,220,966.00
November	1998	Hurricane/Tropical Storm	9	0	$4,083,383.00	$6,125,074.00
September	1999	Hurricane/Tropical Storm	0	0	$0.00	$160,222.00
October	1999	Hurricane/Tropical Storm	1	0	$157,541,949.00	$122,118,315.00
November	2001	Hurricane/Tropical Storm	0	0	$0.00	$21,923.00
September	2004	Hurricane/Tropical Storm	0	0	$25,897,813.00	$207,305,832.00
August	2005	Hurricane/Tropical Storm	3	3	$168,187,081.00	$39,760,539.00
October	2005	Hurricane/Tropical Storm	1	1	$0.00	$2,982,040,457.00
August	2008	Hurricane/Tropical Storm	0	0	$0.00	$3,606.00
July	2010	Hurricane/Tropical Storm	0	0	$0.00	$1,068.00
August	2012	Hurricane/Tropical Storm	0	0	$0.00	$262,117.00
October	2012	Hurricane/Tropical Storm	0	0	$0.00	$676.00
				Total:	**$789,380,779.00**	**$13,972,458,333.00**

Source: SHELDUS, September 2014

Table 3.19 - NCDC Storm Surge Data for Miami-Dade County, 1950-2013

Location	Date	Event Type	Deaths/ Injuries	Property Damage	Crop Damage
Miami-Dade Coastal Zone	10/24/2005	Storm Surge/Tide	0/0	$0	$0
Miami-Dade Coastal Zone	10/30/2007	Storm Surge/Tide	0/0	$0	$0
Miami-Dade Coastal Zone	11/01/2007	Storm Surge/Tide	0/0	$0	$0
Miami-Dade Coastal Zone	08/26/2012	Storm Surge/Tide	0/0	$0	$0
Miami-Dade Coastal Zone	10/26/2012	Storm Surge/Tide	0/0	$0	$0
			Total:	**$0**	**$0**

Source: NCDC, April 2014



Source: NOAA/National Hurricane Center

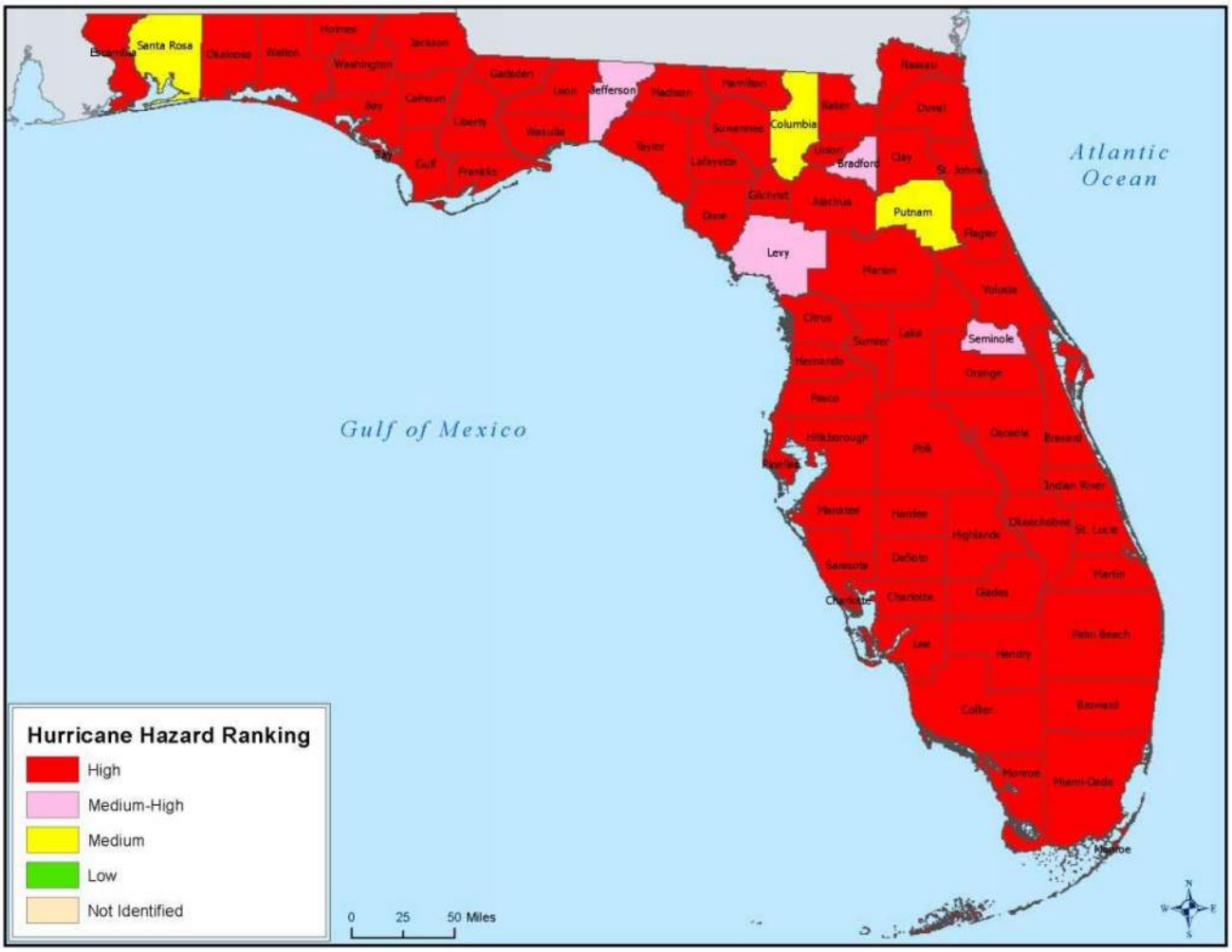
Figure 3.18 - Past Track Map of U.S. Hurricanes Impacting Cutler Bay

Frequency/Likelihood of Future Occurrence

Hurricane and Tropical Storm

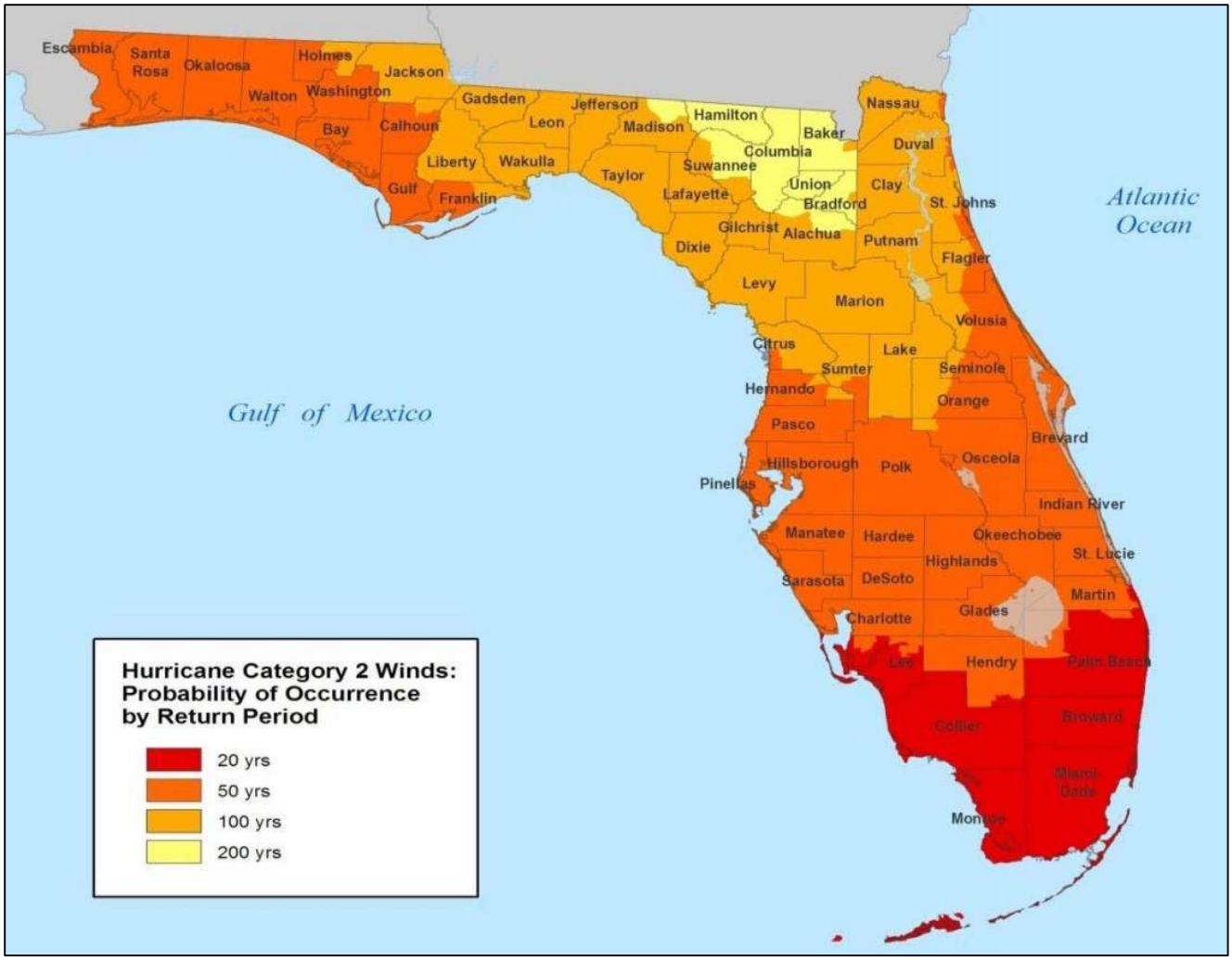
Likely – Given the 31 hurricane and tropical storm occurrences recorded by the NCDC over a period of 16 years (1996- 2012), 1.9 hurricane or tropical storm events affect Miami-Dade County on average each year. According to a vulnerability analysis completed for the State of Florida Hazard Mitigation Plan, Miami-Dade County is considered a high-risk jurisdiction as shown in Figure 3.19.

Figure 3.20 contains a summary of the probability of occurrence that each county has based on geographic location for a return period of 20, 50, 100 or 200 years for a Category 2 hurricane; Miami-Dade County has a probability of experiencing a Category 2 hurricane at least once every 20 years. Figure 3.21 contains a summary of the probability of occurrence that each county has based on geographic location for a return period of 200, 500, 1,000 or greater than 1,000 years for a Category 5 hurricane; the Cutler Bay area within Miami-Dade County has a probability of experiencing a Category 5 hurricane at least once every 200 years.



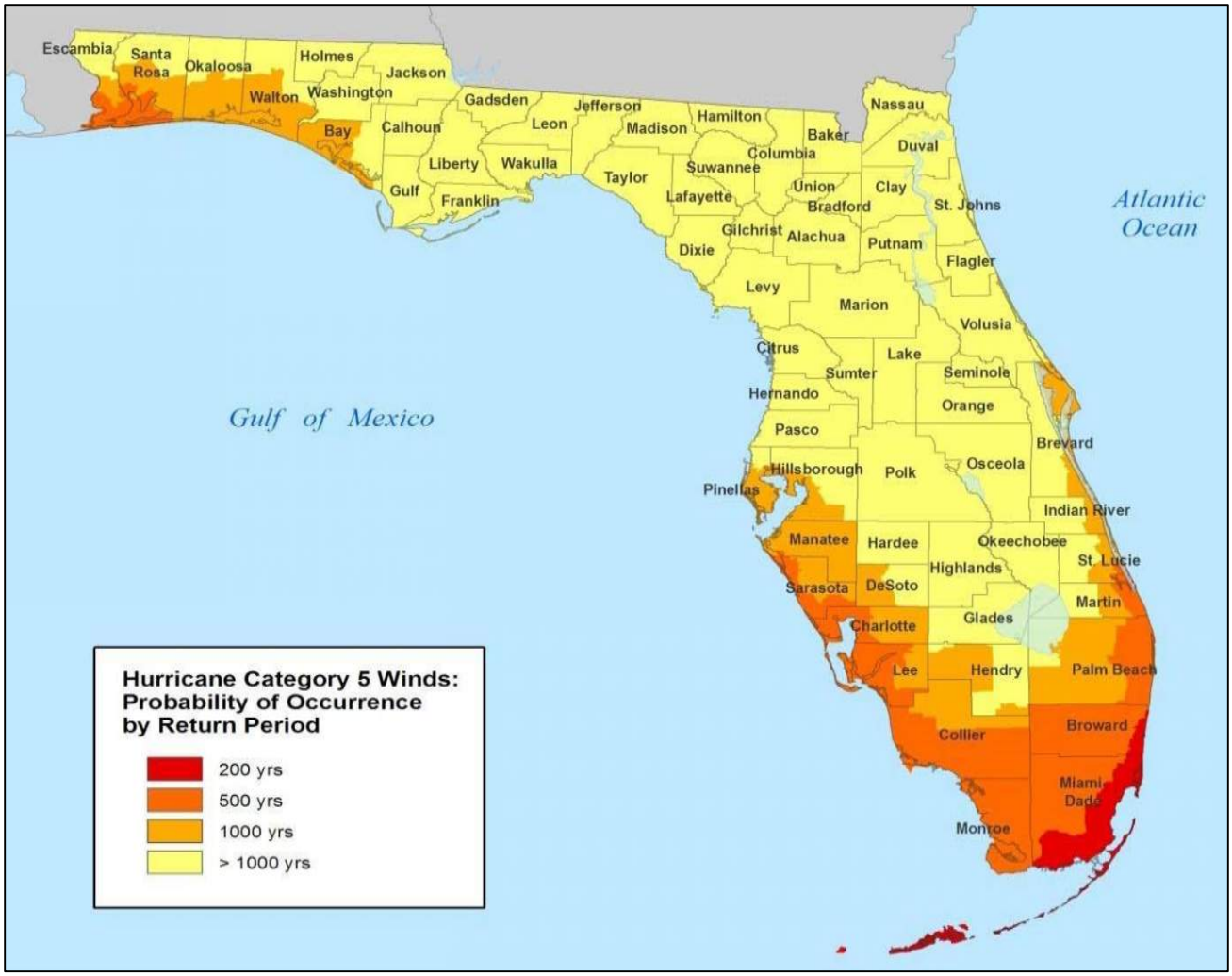
Source: State of Florida Enhanced Hazard Mitigation Plan

Figure 3.19 – Hurricane Hazard Ranking by County



Source: State of Florida Enhanced Hazard Mitigation Plan

Figure 3.20 - Hurricane Category 2 Probability of Occurrence



Source: State of Florida Enhanced Hazard Mitigation Plan

Figure 3.21 - Hurricane Category 5 Probability of Occurrence

Coastal Storm Surge

Likely – Given the 5 storm surge occurrences recorded by the NCDC over a period of seven years (2005-2012), 0.7 coastal storm surge events affect Miami-Dade County on average each year.

Climate Change and Hurricane and Tropical Storms

One of the primary factors contributing to the origin and growth of tropical storm and hurricanes systems is water temperature. Sea surface temperature may increase significantly in the main hurricane development region of the North Atlantic during the next century as well as in the Gulf of Mexico.

Sea level change will be particularly important in influencing storm surge flooding in the Cutler Bay area, since the area is already subject to flooding from above normal tides, surge and rainfall events from hurricanes and less powerful tropical storms. As a result of sea-level rise, flooding from just high tide events is becoming more common. The 7-foot storm surge in Miami-Dade County from Hurricane Wilma (Category 5) has a likelihood of occurring once every 76 years; a 2 foot sea level rise would increase the likelihood to once every 5 years (WRI, 2014).

3.2.7 Assessment of Areas Likely to Flood

The following targeted areas are identified by the FMPC as areas likely to flood in the future. Some of these areas are already experiencing flooding but others are not. For example, changes in floodplain development, the watershed, population in combination with climate change and sea level rise will make these targeted areas more likely to flood in the future.

Identified Area #1: 100yr SFHAs

According to a September 11, 2009 Flood Insurance Study prepared by FEMA, approximately half of the Town is already located within a Special Flood Hazard Area (SFHA). Given that the population of Cutler Bay is projected to increase by 50% between 2010 and 2020, changes in floodplain development and development within the watershed in general is likely to increase the size of the SFHAs due to an increase in impervious area. Furthermore, with its porous geology and low topography, Cutler Bay's infrastructure and groundwater are particularly vulnerable to the effects of climate change and sea level rise.

Identified Area #2: Areas of Localized Stormwater Flooding

Due to the low elevations, a flat terrain, a consistent level of annual precipitation and the tidal influence on canal drainage resulting from heavy rainstorms, tropical storms, and hurricanes; it is highly likely that unmitigated properties will continue to experience localized flooding. The projected 50% increase in population by 2020 will likely lead to new development. An increase in imperious area will only exacerbate the localizing flooding issues unless measures are taken to reduce the volume of runoff. Furthermore, the intensity of individual rainfall events is likely to increase in the future due to climate change which will further overwhelm stormwater drainage systems.

Identified Area #3: Repetitive Loss Areas

Properties categorized as repetitive loss properties have a greater need for flood protection. Repetitive loss can be attributed to development within the 100-yr floodplain as well as localized stormwater flooding. As mentioned above, both types of flooding are likely to increase in the future due to development in the floodplain/watershed as well as due to the effects of climate change and sea level rise. Therefore, is it very likely that repetitive loss properties will continue to flood in the future.

Identified Area #4: Zone X (Unshaded)

There are 3,535 improved parcels within Cutler Bay that are located outside of the SFHA with a total value of $606,893,164. Only 9% of buildings within the X Zone are insured, and as the repetitive loss figures in Section 3.3 show below, flooding is not limited to the 100-yr flood zones. As mentioned above, changes in floodplain development and development within the watershed in general are likely to increase the size of the SFHAs due to an increase in impervious area. Therefore, the Zone X area is likely subject to future flood risk.

Identified Area #5: The Entire Town of Cutler Bay

Sea level change will be particularly important in influencing storm surge flooding in the Cutler Bay area. A 2 foot sea level rise would increase the likelihood of a Category 5 hurricane to once every 5 years (WRI, 2014). As shown in Section 3.3 below, almost the entire Town becomes vulnerable to property damaging flooding from a Category 3 or stronger hurricane.

3.2.8 Flood Hazards Profile Summary

Table 3.20 summarizes the results of the hazard profile for the Town of Cutler Bay based on hazard identification data and input from the FMPC. For each hazard profiled within Section 3.2, this table includes the likelihood of future occurrence and whether or not the hazard is considered a priority for the Town.

Table - 3.20 Summary of Flood Hazard Profile Results

Hazard	Likelihood of Future Occurrence	Priority Hazard
Climate Change and Sea Level Rise	Occasional	Y
Coastal/Canal Bank Erosion	Likely	Y
Dam/Levee Failure	Unlikely	N
Flood: 100-/500-year	Likely	Y
Flood: Stormwater/Localized Flooding	Highly Likely	Y
Hurricane and Tropical Storms (including Storm Surge)	Likely	Y

3.3 Vulnerability Assessment

Requirement §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. Plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:

A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;

(B): An estimate of the potential dollar 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; and

(C): 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.

The FMPC conducted a vulnerability assessment of the hazards identified as a priority in order to assess the impact that each hazard would have on the Town. The vulnerability assessment quantifies, to the extent feasible using best available data, assets at risk to natural hazards and estimates potential losses. Vulnerability assessments followed the methodology described in the FEMA publication *Understanding Your Risks—Identifying Hazards and Estimating Losses*. The vulnerability assessment first describes the total vulnerability and values at risk and then discusses vulnerability by hazard.

Data used to support this assessment included the following:

- County GIS data (hazards, base layers, and assessor's data)
- Hazard layer GIS datasets from federal agencies
- Written descriptions of inventory and risks provided by the Miami-Dade County Local Mitigation Strategy and State Hazard Mitigation Plan
- Other Existing plans and studies provided by the Town

Cutler Bay Assets at Risk

Miami-Dade County's parcel layer was used as the basis for the inventory of developed parcels. Table 3.21 shows the count, land value, improved value, content value and total value of parcels in Cutler Bay.

Table 3.21 - Cutler Bay Property Assets at Risk by Property Type

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value[1]
Residential	12,575	12,552	$397,212,144	$1,198,688,315	$599,344,158	$1,798,032,473
Commercial	86	84	$133,843,386	$83,764,330	$83,764,330	$167,528,660
Education	10	10	$15,522,287	$47,013,077	$47,013,077	$94,026,154
Government	87	13	$49,412,594	$36,347,156	$36,347,156	$72,694,312
Religious	8	8	$7,175,576	$12,534,413	$12,534,413	$25,068,826
Other	590	31	$85,073,136	$30,292,386	$42,500,066	$72,792,452
Total	**13,356**	**12,698**	**$688,239,123**	**$1,408,639,677**	**$821,503,199**	**$2,230,142,876**

Source: Miami-Dade County 2013 Tax Assessor's Data

[1]Total value does not include land value.

Critical Facility Inventory

Of significant concern with respect to any disaster event is the location of critical facilities in the planning area. Critical facilities are often defined as those essential services and facilities in a major emergency which, if damaged, would result in severe consequences to public health and safety or a facility which, if unusable or unreachable because of a major emergency, would seriously and adversely affect the health, safety, and welfare of the public. Critical facilities in Cutler Bay are shown in Figure 3.22.

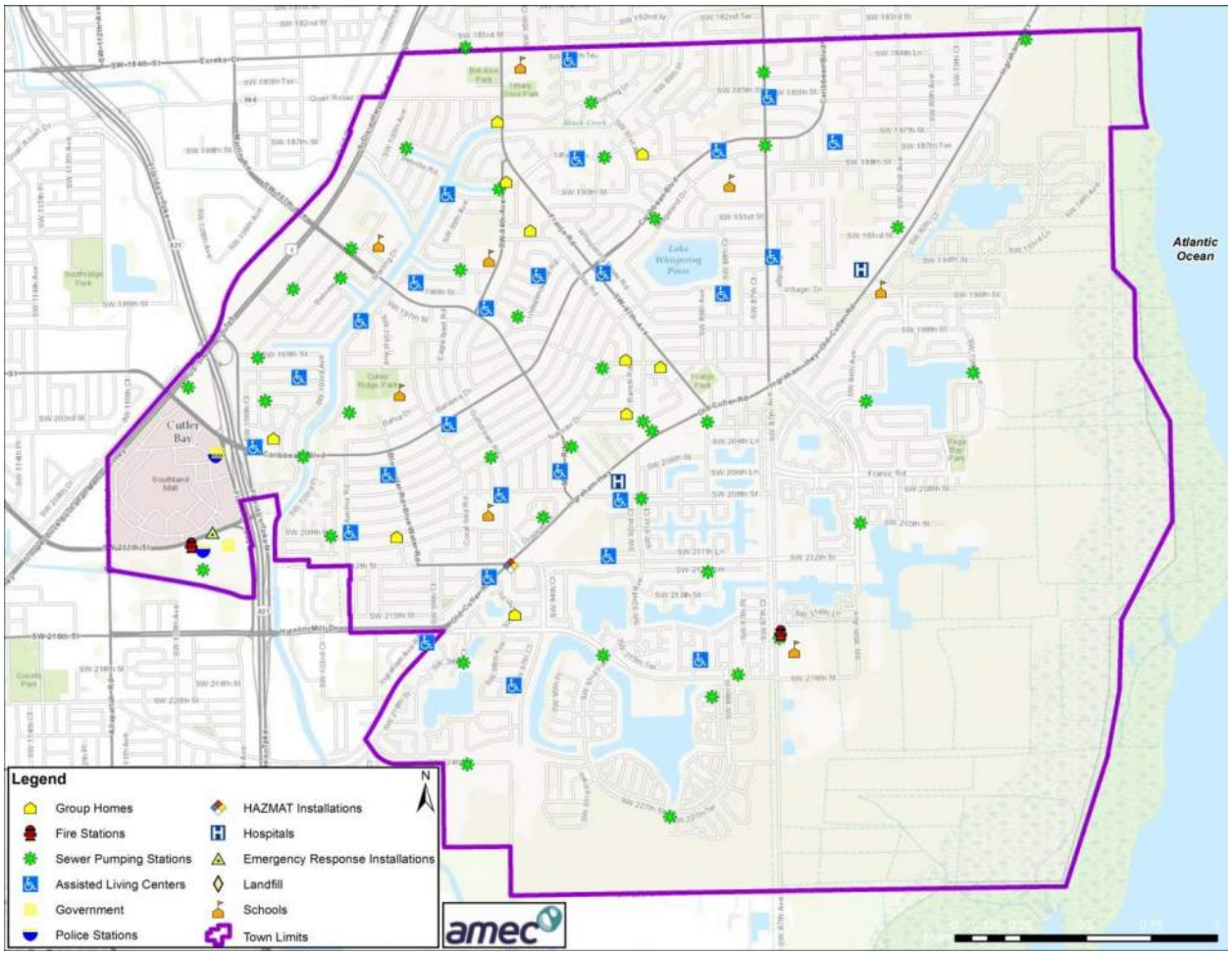


Figure 3.22- Cutler Bay Critical Facilities

Cultural, Historic and Natural Resources

Historic and Archaeological Resources

Old Cutler Road, a designated historic roadway, traverses the Town. The Old Cutler Road zoning overlay district addresses preservation and enhancement of the historic and community character along this corridor. There are no other designated historic or archaeological districts or sites in the Town at present. Most development in the Town occurred after 1950, with only 106 housing units having been built prior to 1939.

Natural Features and Resources

The Town of Cutler Bay, like Miami-Dade County as a whole, contains and/or is proximate to numerous environmentally sensitive areas and resources, including two national parks and an aquatic preserve. The Town's eastern boundary abuts Biscayne National Park, and includes 735.9 acres of lands in parks,

preserves or conservation areas and 515.41 acres of protected vacant lands. These lands are primarily located in the eastern portion of the Town adjacent or proximate to Biscayne National Park. In addition, many areas in the eastern portion of the Town are targeted for acquisition for conservation and/or other public purposes. These areas are denoted with a cross-hatch on the future land use map shown in Figure 3.24. Although the Town has a significant coastline along Biscayne Bay, it does not have a developed waterfront; nor can its waterfront be developed in the future. The Town's major natural resources and features are described as follows.

Parks, Preserve and Conservation

A total of 735.9 acres (11%) of the Town's land area are in public parks, or reserved for environmental and conservation purposes. These lands include the seven public parks located within the Town's boundaries, and wetland and water conservation areas located between the developed areas east of Old Cutler Road and Biscayne National Park. A total of 352.8 acres (5%) are in inland waters, including canals, man-made lakes and drainage features.

Water Bodies and Floodplains

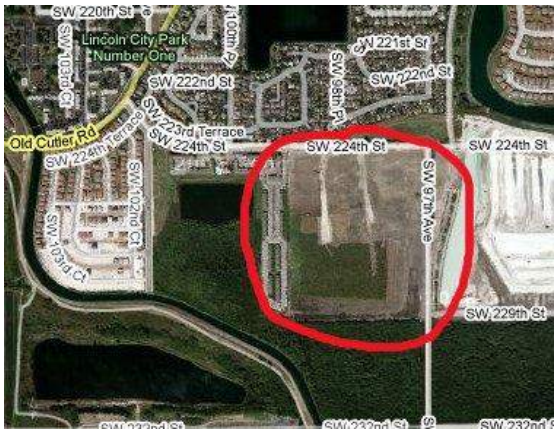
The Town contains 354.6 acres of coastal waters and 317.0 acres of inland waters in man-made lakes and inland waters, including canals. The Town is traversed by six major canals that lie within and/or border the Town: C-100, C100B, C-1, C-1N, C-1W and L31E. These canals provide important flood protection and drainage functions to the Town and surrounding areas. The Town's flood zones are shown in Figure 3.11. As can be seen, most of the Town is located within the 100-year floodplain.

Natural and Beneficial Functions

Wetlands as well as floodplains are both important natural assets to the Town of Cutler Bay. The Town contains significant coastal wetlands adjacent to Biscayne National Park. These wetlands are an important component of South Florida's ecosystem that will be conserved and, where appropriate, restored. Approximately 1,430 acres of these wetlands are in public ownership, and all are designated for Conservation purposes on the Future Land Use Map shown as Figure 3.24. The value in these resources can be better realized by the integration of floodplain management efforts with other community goals and objectives.

Wetlands function as natural sponges that trap and slowly release surface water, rain, snowmelt, groundwater and flood waters. Trees, root mats, and other wetland vegetation will slow the speed of floodwaters and distribute them more slowly over the floodplain. This combined water storage and braking action lowers flood heights and reduces erosion. Wetlands within and downstream of urban areas are particularly valuable, counteracting the greatly increased rate and volume of surface-water runoff from pavement and buildings. The holding capacity of wetlands helps control floods and prevents water logging of crops. Preserving and restoring wetlands, together with other water retention, can often provide the level of flood control otherwise provided by expensive dredge operations and levees.

The Cutler Wetlands is home to many plants and animals including some mangrove forests. Key Biscayne has one of the largest and longest mangrove forest still left on the east coast of the United States. The word mangrove is used to describe several trees, not closely related to one another, that flourish in salty environments.



The Town of Cutler Bay has restored a 54 acre wetland track located at SW 224th Street and 97th Avenue. This project cleared invasive vegetation to provide a permanent habitat for birds and other habitat. Over 150 species have been observed (in both non-passerines and passerines).

Soils and Minerals

The Town is comprised of tidal marl and muck, marl, and urban soils. In general, tidal marl and muck is unsuitable for development and characteristic of wetlands, while marl often requires special treatment prior to construction. Marl soils are calcareous (limestone derived) soils that characterize lands that are or were historically flooded during the summer and dry during the winter, and that exhibit poor drainage. Urban soils refer to man-made or significantly altered soils resulting from development. The areas of the Town east of Old Cutler Road are characterized by marl soils, while the coastal wetlands adjacent to Biscayne National Park are tidal marl and muck. The Town is underlain by Miami Limestone. There are no mineral extraction areas in the Town.

Growth and Development Trends

The Town of Cutler Bay incorporated as Miami-Dade County's newest municipality in November 2005. It comprised most of two Census Designated Places, Cutler Ridge and Lakes by the Bay, and a strip of unincorporated Miami-Dade County south of 224 Street. The Census 2010 figures showed a population of 40,286 persons and 14,620 housing units in the Town. The average household size at the time of the 2010 Census was 3.15 persons per household.

The Town's population estimates and projections are shown in Table 3.22 as presented in the Town's Comprehensive Growth Management Plan dated April 2008. Between 2000 and 2010, the population of the area that incorporated as the Town of Cutler Bay increased by 24.8%. The population projections for Cutler Bay were made by projecting the Town's share of the Miami-Dade County population projected for Minor Statistical Area 7.1, a statistical area that encompasses the Town.

Most of Cutler Bay has already been developed. But there are a few tracts of land to the south and east which can be developed into the future. Fortunately much of the eastern portion of the town must remain undeveloped because of the Cutler Wetlands. The future land use map directs the type of development for those properties which remain undeveloped.

Much of the current re-development has been occurring along US 1 where commercial development occurs. Some commercial properties have been demolished and rebuilt and others have been refurbished. Fortunately most of this area along US 1 is in an X-Zone which is out of a designated floodplain.

Table 3.22 - Population Projections for the Town of Cutler Bay

	2015	2020
Town of Cutler Bay	50,000	60,000
MSA 7.1	59,520	75,555
Town % of MSA 7.1 Population	84%	80%

Source: Town of Cutler Bay Comprehensive Growth Management Plan, April 2008

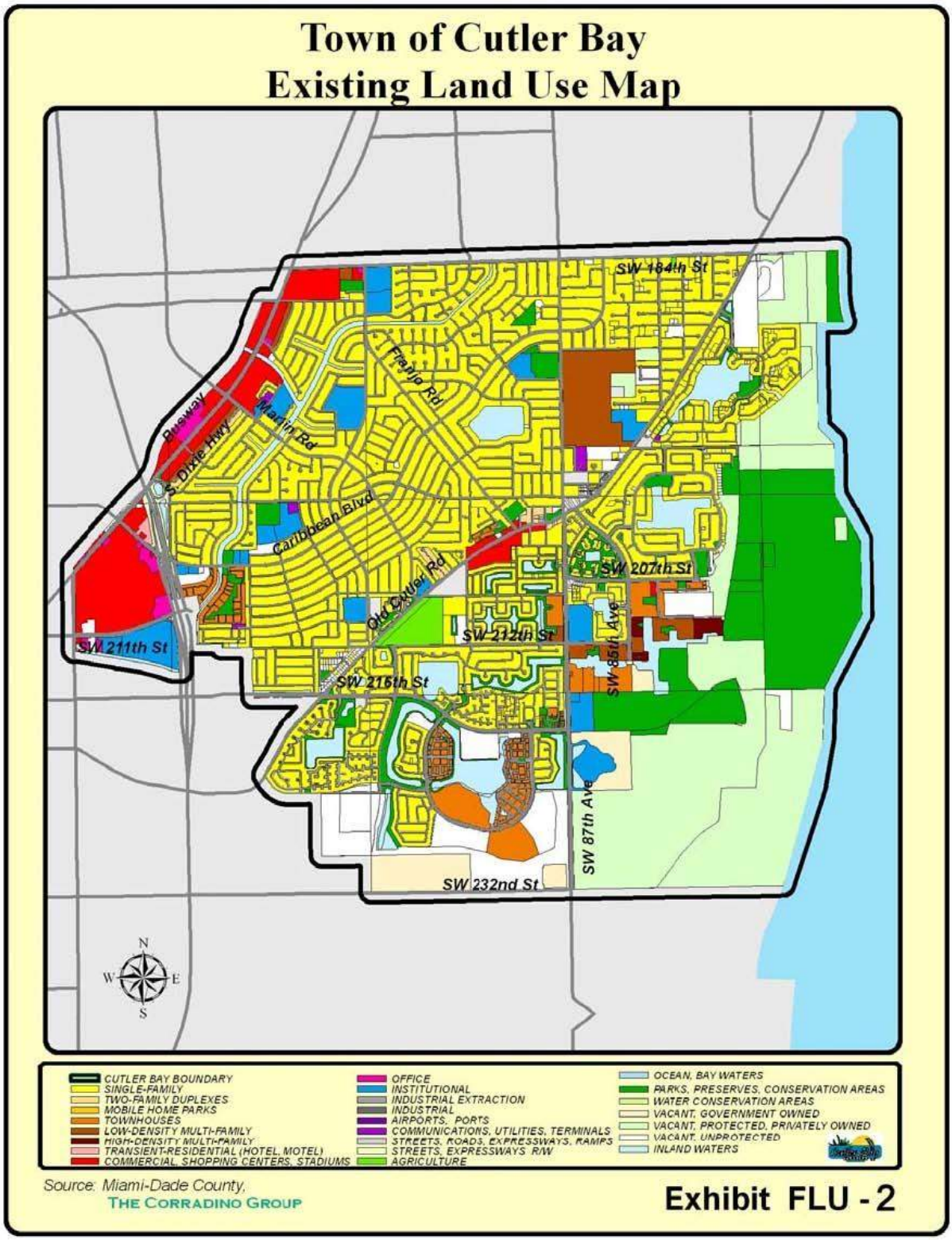
Land Use

As noted in the Growth Management Plan, the Town of Cutler Bay was substantially built-out at the time of its incorporation in 2005, and has a limited supply of vacant developable land. Single family residential development is the predominant land use, with commercial development concentrated along US-1 and Old Cutler Road. Due to these factors, the guiding principles of the Future Land Use Element and the Town's planning program are preservation and enhancement of existing residential neighborhoods, resource protection and enhancement, and redevelopment of commercial areas as mixed-use activity centers. Table 3.23 reflects existing land uses within the Town by category and acreage. Figures 3.23 and 3.24 reflect existing and future land use within Cutler Bay, respectively.

Table 3.23- Existing Land Use in the Town of Cutler Bay

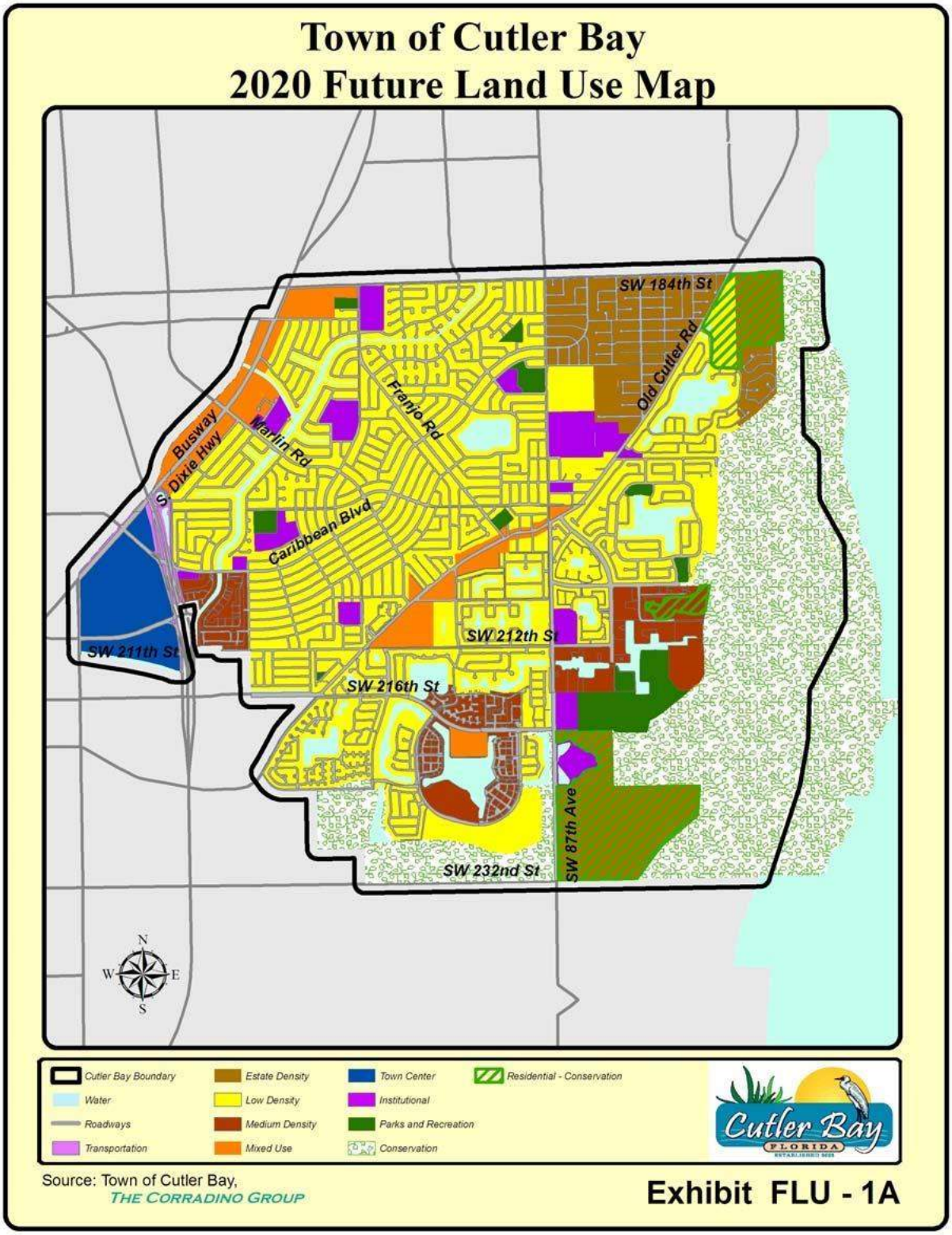
Land Use	Acres
Single Family Residential	2,130.8 (33%)
Duplex	21.7 (.3%)
Townhouses	167.0 (3%)
Low-Density Multi-Family	139.3 (2%)
High Density Multi-Family	14.6 (.2%)
Transient Residential (Hotel/Motel)	3.6 (.06%)
Commercial	249.6 (4%)
Office	26.7 (.4%)
Industrial	0.0
Institutional	197.5 (2%)
Communications, Utilities, Terminals	9.6 (.1%)
Parks, Preserves and Conservation	735.9 (11%)
Agriculture	36.5 (.6%)
Vacant Protected, Privately Owned	907.2 (14%)
Vacant, Government Owned	118.3 (2%)
Vacant Unprotected	375.9 (6%)
Streets, Roads, Expressways, Ramps	1,036.1 (16%)
Inland Water	352.8 (5%)
Total	**6,523.1**

Source: Cutler Bay Comprehensive Growth Management Plan, 2008



Source: Cutler Bay Comprehensive Growth Management Plan, 2008

Figure 3.23- Cutler Bay Existing Land Use Map



Source: Cutler Bay Comprehensive Growth Management Plan, 2008

Figure 3.24 - Cutler Bay Future Land Use Map

3.3.1 Vulnerability of Cutler Bay to Specific Hazards

The Disaster Mitigation Act regulations require that the FMPC evaluate the risks associated with each of the hazards identified in the planning process. This section summarizes the possible impacts and quantifies the Town's vulnerability to each of the hazards identified as a priority hazard in Table 3.20 in Section 3.2.7 Flood Hazards Profile Summary. The hazards evaluated as part of this vulnerability assessment include:

- Climate Change and Sea Level Rise
- Coastal/Canal Bank Erosion
- Flood: 100-/500-year
- Flood: Stormwater/Localized Flooding
- Hurricane and Tropical Storms (including storm surge)

Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low -** The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low -** Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium -** Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High -** Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High -** Very widespread with catastrophic impact.

Vulnerability can be quantified in those instances where there is a known, identified hazard area, such as a mapped floodplain. In these instances, the numbers and types of buildings subject to the identified hazard can be counted and their values tabulated. Other information can be collected in regard to the hazard area, such as the location of critical community facilities (e.g., a fire station), historic structures, and valued natural resources (e.g., an identified wetland or endangered species habitat). Together, this information conveys the impact, or vulnerability, of that area to that hazard.

3.3.2 Climate Change and Sea Level Rise Vulnerability Assessment

Likelihood of Future Occurrence—Occasional
Vulnerability—Low

Cutler Bay, due to its location on the Atlantic Coast, is vulnerable to the potential impacts of climate change and sea level rise. The climate change hazard profile in Section 3.2.1 discusses how climate-driven hazards such as hurricanes and flooding are likely to increase in frequency, and possibly intensity, in the future. Thus the 25-year flood of today may become the 10 year event in the future. The reader should refer to the vulnerability assessment discussions on erosion (Section 3.3.3), flood (Section 3.3.4), hurricane (Section 3.3.6) for the current exposure and risk to these hazards with the perspective that climate change has the potential to exacerbate the existing risk and vulnerabilities. This section will focus on an assessment of direct impacts from sea level rise, using best available data. The potential impacts of

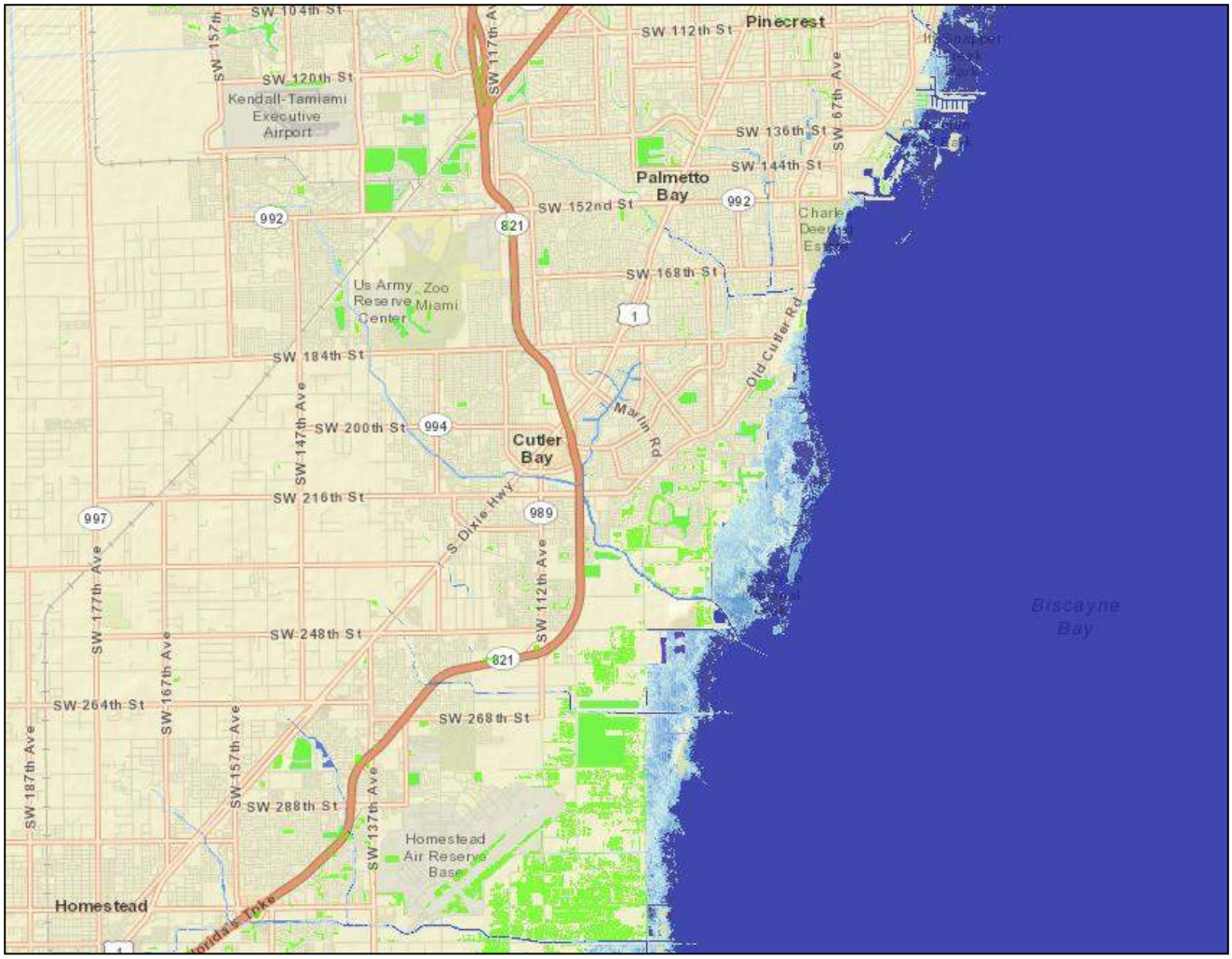
climate change and sea level rise include increased flooding frequency, potential damage to critical infrastructure, and increasing public costs associated with flood insurance claims, infrastructure repair and maintenance, environmental impacts and increased costs associated with emergency management efforts.

Sea Level Rise

The potential impacts to buildings, assets, and infrastructure from climate change and sea level rise will be negligible based on the buffer from the Atlantic Ocean by the Key Biscayne National Park and the Cutler wetlands; however, limited increases in the water level of canals may be an issue in the future. Sea level rise can have the following impacts on property and infrastructure in Cutler Bay:

- Coastal infrastructure: bridges, docks, piers
- Jettys/erosion control structures
- Roads and bridges
- Utility infrastructure
- Erosion hazard zones
- Built environment including residential development
- Natural resources
- Recreational facilities and amenities such as beaches, public access points, and parks
- Salt water intrusion into water supply
- Loss of property and property tax revenue due to inundation

As discussed in Section 3.2.1, the USACE projection for sea level rise in southeast Florida is 3-7 inches by 2030 and 9-24 inches by 2060. NOAA Coastal Services Center provides a sea level rise and coastal flooding impacts viewer in order to assess how sea level rise will impact coastal communities. Figure 3.25 reflects the impact of a one-foot sea level rise on Cutler Bay using the coastal flooding impacts viewer provided by NOAA. The sea levels represent inundation at high tide, and areas that are hydrologically connected are shown in shades of blue (darker blue = greater depth). The low-lying areas, displayed in green, are hydrologically "unconnected" areas that may flood. Table 3.24 provides an exposure analysis based on the elevation of land that structures are located on relative to local high tide. The results do not factor in structure elevation.



Source: http://www.csc.noaa.gov/digitalcoast/tools/slrviewer

Figure 3.25- One-Foot Sea Level Rise Impact on Cutler Bay

Table 3.24 - Sea Level Rise and Coastal Flood Exposure in Cutler Bay

		Elevation relative to local high tide line (Mean Higher High Water)									
	Unit	**< 1ft**	**< 2ft**	**< 3ft**	**< 4ft**	**< 5ft**	**< 6ft**	**< 7ft**	**< 8ft**	**< 9ft**	**< 10ft**
BY TOTALS											
High social vulnerability population	Count	859	1236	1468	1900	3423	5341	7318	9449	10767	11484
Medium social vulnerability population	Count	5	10	22	91	539	2604	6342	9700	11347	11825
Low social vulnerability population	Count	830	913	1014	1238	2036	5021	8366	10727	12119	12879
Property value	$Million	169	253	310	398	641	1195	1918	2524	2898	3101
Population	Count	1694	2159	2504	3229	5998	12966	22026	29877	34232	36188
Caucasian population	Count	1281	1628	1887	2451	4649	10160	17424	23725	27235	28819
Population of color	Count	465	597	693	868	1503	3125	5144	6875	7823	8247
African-American population	Count	349	454	530	662	1127	2273	3654	4842	5505	5801
Asian population	Count	48	57	64	85	166	389	678	919	1054	1114
Hispanic population	Count	970	1250	1451	1868	3340	7066	12001	16382	18681	19643
Native American population	Count	13	19	22	26	45	100	179	241	279	296
Homes	Count	712	937	1096	1373	2404	4908	8079	10837	12359	13045
Hospitals	Count	0	0	0	0	0	0	0	0	0	1
Schools	Count	0	0	0	0	0	0	1	6	10	12
Colleges and Universities	Count	0	0	0	0	0	0	0	1	1	2
Libraries	Count	0	0	0	0	0	0	0	0	1	1
Houses of worship	Count	0	0	0	0	0	2	2	3	3	4
Government buildings	Count	0	0	0	0	0	0	0	2	5	6
Roads	Miles	0	0	0	5	24	63	97	113	122	127
Federal roads	Miles	0	0	0	0	0	0	0	0	0	1
Local roads	Miles	0	0	0	5	24	63	97	113	122	125
Secondary roads	Miles	0	0	0	0	0	0	0	0	0	1
Passenger stations	Count	0	0	0	0	0	0	0	1	1	1
Intercity bus stations	Count	0	0	0	0	0	0	0	1	1	1
Transit passenger stations	Count	0	0	0	0	0	0	0	1	1	1
Power plants	Count	0	0	0	0	0	0	0	1	1	1
Commercial & industrial power plants	Count	0	0	0	0	0	0	0	1	1	1
EPA listed sites	Count	0	0	0	2	2	4	7	13	20	24
NPDES sites	Count	0	0	0	0	0	1	1	5	7	8
RADINFO sites	Count	0	0	0	0	0	1	4	6	11	14

Hazardous waste sites	Count	0	0	0	0	0	1	4	6	11	14
Minor hazwaste source sites	Count	0	0	0	0	0	0	3	4	6	7
Unspecified hazardous waste sites	Count	0	0	0	0	0	1	1	2	5	7
Wastewater sites	Count	0	0	0	0	0	1	1	5	7	8
Nonmajor wastewater sites	Count	0	0	0	0	0	1	1	5	7	8
Sewage plants	Count	0	0	0	2	2	2	2	2	2	2
Land	Acres	619	834	915	1036	1345	2095	3126	4059	4646	4967
Protected land	Acres	247	406	445	460	469	475	483	493	500	505
Local protected land	Acres	36	66	74	78	84	88	96	106	113	118
Source: Climate Central 2014, Findings from Surging Seas (SurgingSeas.org)											

3.3.3 Coastal/Canal Bank Erosion Vulnerability Assessment

Likelihood of Future Occurrence—Likely
Vulnerability—Low

Coastal Erosion
The severity of coastal erosion is typically measured through a quantitative assessment of annual shoreline change for a given beach cross-section profile (feet or meters per year) over a long period of time. Erosion rates vary as a function of shoreline type and are influenced primarily by episodic events, but can be used in land use and hazard management to define areas of critical concern. A report completed in June 2012 by the Florida Department of Environmental Protection (DEP), Division of Water Resource Management, titled "Critically Eroded Beaches in Florida" which inventoried critically eroded areas along the Atlantic and Gulf coasts did not identify any areas of erosion within the Cutler Bay planning area. Fortunately, Biscayne National Park forms the eastern boundary of the Cutler Bay planning area along Biscayne Bay. The shoreline in this area is protected from coastal erosion by the absence of development and the tangled root systems of the mangroves that are preserved in this area. Because of this buffer (including the Cutler wetlands), no damage to insurable buildings, infrastructure, or assets within Cutler Bay is expected.

Canal Bank Erosion
Cutler Bay has experienced limited canal bank erosion in the past. Canal bank erosion is a natural process, but acceleration of this natural process leads to a disproportionate sediment supply, stream channel instability, land loss, habitat loss and other adverse effects. Erosion has occurred and will occur as a matter of course on an occasional basis in all canal bank areas. As a result, no damage to insurable buildings, infrastructure, or assets have been identified within Cutler Bay and none is expected.

3.3.4 Flood: 100-/500-year Vulnerability Assessment

Likelihood of Future Occurrence—Likely
Vulnerability—High

Flood damage is directly related to the depth of flooding by the application of a depth damage curve. In applying the curve, a specific depth of water translates to a specific percent damage to the structure which translates to the same percentage of the structure's replacement value. As previously shown in Figure 3.11, a large portion of the Town is located in areas vulnerable to 100-year flooding under normal flood circumstances.

Methodology

Parcel counts by FEMA flood zone were determined using a spatial intersection of the tax parcels, provided by the Town of Cutler Bay, and the effective FEMA flood zones provided in the Miami-Dade County FEMA DFIRM Database, effective 9/11/2009. This methodology was used to determine whether a parcel is affected by multiple flood zones. In the case of parcels affected by multiple zones, the entire parcel assessment value was applied to the flood zone covering the majority of the parcel in order to provide exposure estimates for each FEMA flood zone. In order to determine the correct occupancy class for each parcel, the County Land Use Codes (CLUC) provided in the Cutler Bay tax parcel data were translated into FEMA Hazus specific occupancy classes (i.e. RES1, COM4, EDU2, etc.). These were translated to ensure the correct depth damage factor was applied to the parcel based on its occupancy class to ensure a more accurate damage assessment of the parcel.

Table 3.25 shows the correlation between BFEs and average flood depth. Figure 3.26 depicts the depth of flooding that can be expected within the Town of Cutler Bay during the 100-year flood event.

Table 3.25 - Effective DFIRM BFE and Average Depth

Effective DFIRM BFE (ft)	Average Depth (ft)
7	4
8	3
9	2.5
10	5.5
11	8
12	11
13	12
14	13
15	14.5
16	16
17	17
18	18

Source: FEMA DFIRM September 11, 2009

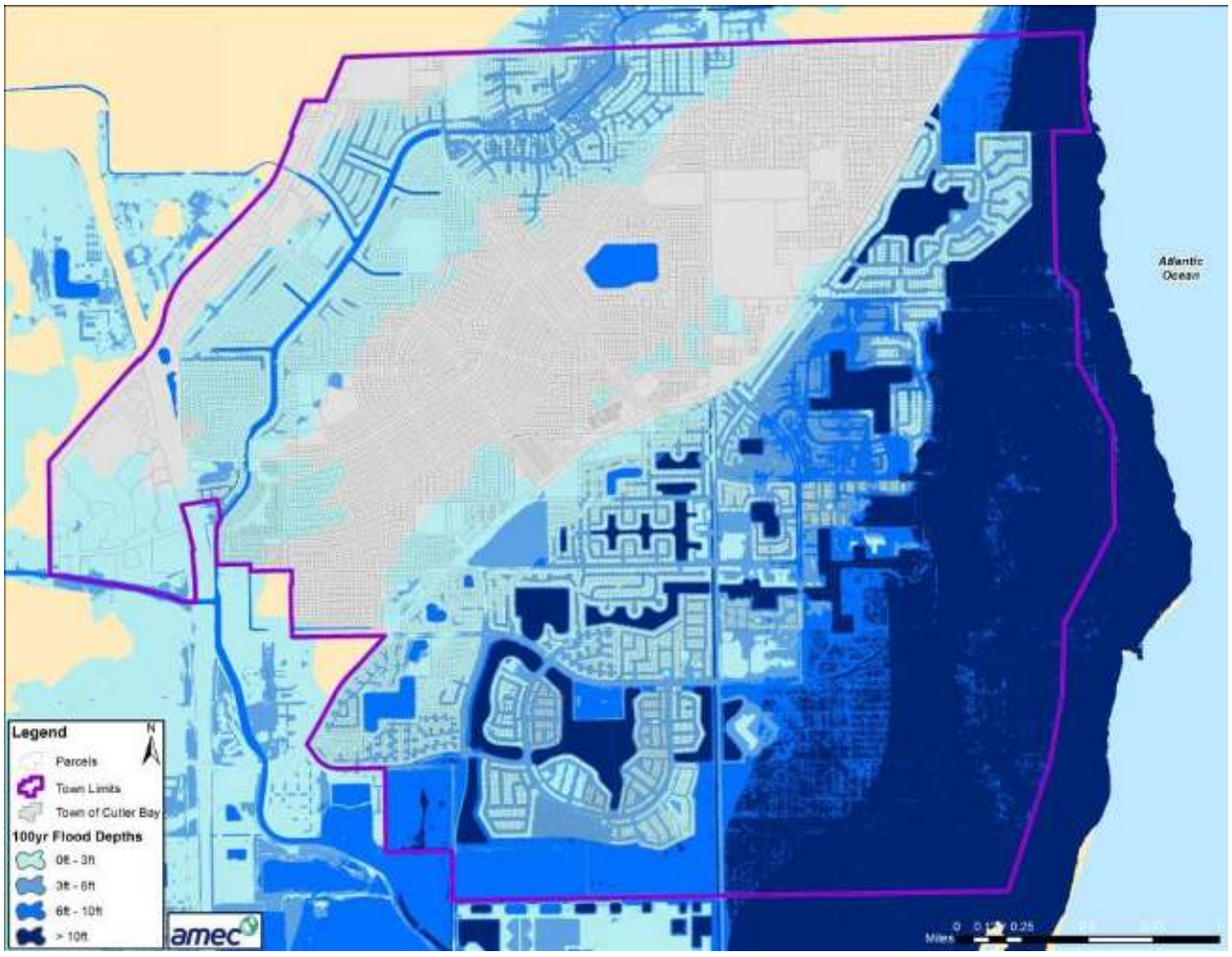


Figure 3.26 - 100-yr Flood Depths for Cutler Bay

Table 3.26 provides the depth damage factors that were used in calculating flood losses for the Town. These depth damage factors were developed based on the USACE Galveston District depth damage curves used in Hazus. All depths assume the structure has no basement.

Table 3.26 - Cutler Bay Flood Loss Damage Factors

	Percent Damaged (%)					
Depth (ft)	**Residential**	**Commercial**	**Religious**	**Government**	**Education**	**Other**
0	10	1	0	0	0	1
1	21	9	10	5	5	10
2	27	14	11	8	7	12
3	32	16	11	13	9	15
4	37	18	12	14	9	19
5	43	20	12	14	10	22
6	46	23	13	15	11	26
7	50	26	14	17	13	30
8	54	30	14	19	15	35
9	58	34	15	22	17	39
10	60	38	17	26	20	42
11	63	42	19	31	24	48
12	67	47	24	37	28	50
13	70	51	30	44	33	51
14	74	55	38	51	39	53
15	79	58	45	59	45	54
16	82	61	52	65	52	55
17	83	64	58	70	59	55
18	84	67	64	74	64	56

Source: FEMA estimated damage factors

Content values estimations are based on FEMA Hazus methodologies of estimating value as a percent of improved structure values by property type. Table 3.27 shows the breakdown of the different property types in Cutler Bay and their estimated content replacement value percentages.

Table 3.27 - Content Replacement Factors

Property Type	Content Replacement Values
Residential	50%
Commercial	100%
Cultural and Parks	100%
Education	100%
Government	100%
Recreation and Entertainment	100%
Religion	100%
Medical	150%
Transportation	150%
Utilities and Communication	150%

Source: Hazus 2.1

Values at Risk

The loss estimate for flood is based on the total of improved and contents value. The land value is represented in the flood tables, but these values are only present to show the value of the land and are not

included in any of the loss estimates as generally the land is not subject to loss from floods. It is important to note that information on those properties mitigated (e.g., floodproofed or elevated) in the SFHA was not available for analysis, thus the resulting flood damage loss estimates could be lower than actual figures. Once the potential value of affected parcels was calculated, damage factors were applied to obtain loss estimates by flood zone.

Table 3.28 is a summary table that shows the count and improved value of parcels that fall within the 1% annual chance floodplain by land use type. Parcels outside the floodplain are also shown (Zone X). Based on this analysis, 9,163 improved parcels fall within the 1% annual chance floodplain for a total value of $1,623,249,713. Additionally, there are 3,535 improved parcels outside of the SFHA with a value of $606,893,164.

Table 3.28 - Property Value Estimates by Flood Zone and Property Type

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value[1]	Loss Estimate
Zone AE							
Residential	7,381	7,358	$189,993,609	$705,569,438	$352,784,719	$1,058,354,157	$261,106,766
Commercial	22	21	$17,417,323	$19,542,291	$19,542,291	$39,084,582	
Education	5	5	$5,937,286	$25,894,629	$25,894,629	$51,789,258	$7,271,837
Government	74	10	$48,896,706	$36,339,568	$36,339,568	$72,679,136	$6,315,052
Religious	2	2	$3,651,250	$7,704,012	$7,704,012	$15,408,024	
Other	379	6	$50,937,103	$18,521,560	$25,386,774	$43,908,334	
Total	**7,863**	**7,402**	**$316,833,277**	**$813,571,498**	**$467,651,993**	**$1,281,223,491**	**$274,693,655**
Zone VE							
Residential	0	0	$0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0	$0
Education	0	0	$0	$0	$0	$0	$0
Government	2	0	$40,000	$0	$0	$0	$0
Religious	0	0	$0	$0	$0	$0	$0
Other	0	0	$0	$0	$0	$0	$0
Total	**2**	**0**	**$40,000**	$0	$0	$0	$0
Zone AH							
Residential	1,726	1,726	$60,652,913	$141,869,952	$70,934,976	$212,804,928	$22,307,541
Commercial	16	16	$64,955,934	$37,093,710	$37,093,710	$74,187,420	
Education	5	5	$9,585,001	$21,118,448	$21,118,448	$42,236,896	$1,035,099
Government	3	2	$24,315	$5,266	$5,266	$10,532	$2,352
Religious	5	5	$3,187,726	$4,283,971	$4,283,971	$8,567,942	
Other	92	7	$12,171,349	$1,878,702	$2,339,802	$4,218,504	$237,225
Total	**1,847**	**1,761**	**$150,577,238**	**$206,250,049**	**$135,776,173**	**$342,026,222**	**$23,582,217**
Zone X							
Residential	3,468	3,468	$146,565,622	$351,248,925	$175,624,463	$526,873,388	$0
Commercial	48	47	$51,470,129	$27,128,329	$27,128,329	$54,256,658	$0
Education	0	0	$0	$0	$0	$0	$0
Government	8	1	$451,573	$2,322	$2,322	$4,644	$0
Religious	1	1	$336,600	$546,430	$546,430	$1,092,860	$0
Other	119	18	$21,964,684	$9,892,124	$14,773,490	$24,665,614	$0
Total	**3,644**	**3,535**	**$220,788,608**	**$388,818,130**	**$218,075,034**	**$606,893,164**	$0

Source: Miami-Dade County 2013 Tax Assessor's Data, FEMA 2009 DFIRM
[1]Total value does not include land value.

Table 3.29 shows a summary of flood loss estimate values by flood zone. This table is arranged by the 1% annual chance flood zones (AE, VE and AH Zones) and the Zone X flood zone (unshaded) combined.

Table 3.29 – Summary of Flood Loss Estimates by Flood Zone

Flood Zone	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value[1]	Loss Estimate
Zone AE	7,863	7,402	$316,833,277	$813,571,498	$467,651,993	$1,281,223,491	$274,693,655
Zone VE	2	0	$40,000	$0	$0	$0	$0
Zone AH	1,847	1,761	$150,577,238	$206,250,049	$135,776,173	$342,026,222	$23,582,217
Zone X	3,644	3,535	$220,788,608	$388,818,130	$218,075,034	$606,893,164	$0
Total	**13,356**	**12,698**	**$688,239,123**	**$1,408,639,677**	**$821,503,199**	**$2,230,142,876**	**$298,275,872**

Source: Miami-Dade County 2013 Tax Assessor's Data, FEMA 2009 DFIRM
[1]Total value does not include land value.

Table 3.30 shows the loss ratio for the flood damage assessment. The loss ratio is the loss estimate divided by the total potential exposure (i.e., total of improved and contents value for all parcels located within the 1% annual chance flood zone) and displayed as a percentage of loss. FEMA considers loss ratios greater than 10% to be significant and an indicator a community may have more difficulties recovering from a flood.

Table 3.30 – 1-Percent-Annual-Chance Loss Ratio

Flood Zone	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value[1]	Loss Estimate	Loss Ratio
1% Annual Chance	9,712	9,163	$467,450,515	$1,019,821,547	$603,428,166	$1,623,249,713	$298,275,872	18.4%

Source: Miami-Dade County 2013 Tax Assessor's Data, FEMA 2009 DFIRM
[1]Total value does not include land value.

Flooded acres

Also of interest is the land area affected by the various flood zones. The following is an analysis of flooded acres in the Town in comparison to total area within the Town limits.

Methodology

GIS was used to calculate acres flooded by FEMA flood zones and land use categories. The Cutler Bay parcel layer and effective DFIRM were intersected and the flooded parcel area was calculated in acres. The flood zone was assigned to any given parcel based on the intersection of the parcel with a flood zone. Parcels can be located in multiple flood zones, and only the flooded acreage within the parcel was counted for each flood zone.

Limitations

One limitation to be made from this analysis is that the parcel layer does not include right-of-way areas. Due to this, there are voids of land that are not accounted for; therefore, this analysis only represents total parcel acres. Tables 3.31 and 3.32 represent a detailed and summary analysis of total improved flooded acres by land use and FEMA DFIRM flood zone, respectively.

Table 3.31 - Total Parcel Acres to Flooded Acres by Land Use

Land Use	Total Parcel Acres	Improved Flooded Acres
Residential	2,286	2,284
Commercial	334	240
Education	105	105
Government	1,458	96
Religious	46	46
Other	1,363	72
Total	**5,593**	**2,843**

Source: Miami-Dade County 2013 Tax Assessor's Data, FEMA 2009 DFIRM

Table 3.32 - Total Parcel Acres to Flooded Acres by Flood Zone

Flood Zone	Total Parcel Acres	Improved Flooded Acres
Zone AE	3,804	1,298
Zone VE	36	0
Zone AH	474	427
Zone X	1,278	1,118
Total	**5,593**	**2,843**

Source: Miami-Dade County 2013 Tax Assessor's Data, FEMA 2009 DFIRM

Population at Risk

A separate analysis was performed to determine the population at risk to the 1% annual chance flood zones (AE, VE and AH Zones) and the Zone X flood zone (unshaded) combined. Using GIS, the DFIRM flood zones were overlayed on the improved residential parcel data. Those residential parcels that intersected the flood zones were counted and multiplied by the Census Bureau household factor for Cutler Bay (3.15). In the case of residential parcels intersected by multiple flood zones, the parcel was assigned to the flood zone covering the majority of the parcel area. As shown in Table 3.33, there is an estimated total population of 39,539 at risk within the 1% annual chance and Zone X flood zones.

Table 3.33 - Cutler Bay Population at Risk to Flood

Flood Zone	Residential Property Count	Population
Zone AE	7,358	23,178
Zone VE	0	0
Zone AH	1,726	5,437
Zone X	3,468	10,924
Total	**12,552**	**39,539**

Source: Miami-Dade County 2013 Tax Assessor's Data, FEMA 2009 DFIRM, U.S. Census Bureau

Critical Facilities at Risk

A separate analysis was performed to determine critical facilities in the 1% and 0.2% annual chance floodplains. Using GIS, the DFIRM flood zones were over laid on the critical facility location data. Figure 3.27 shows critical facilities and DFIRM flood zones. Figure 3.28 shows critical facilities and 100-yr flood depth. Table 3.34 details critical facilities by facility type, flood zone, replacement value, and base flood elevation.

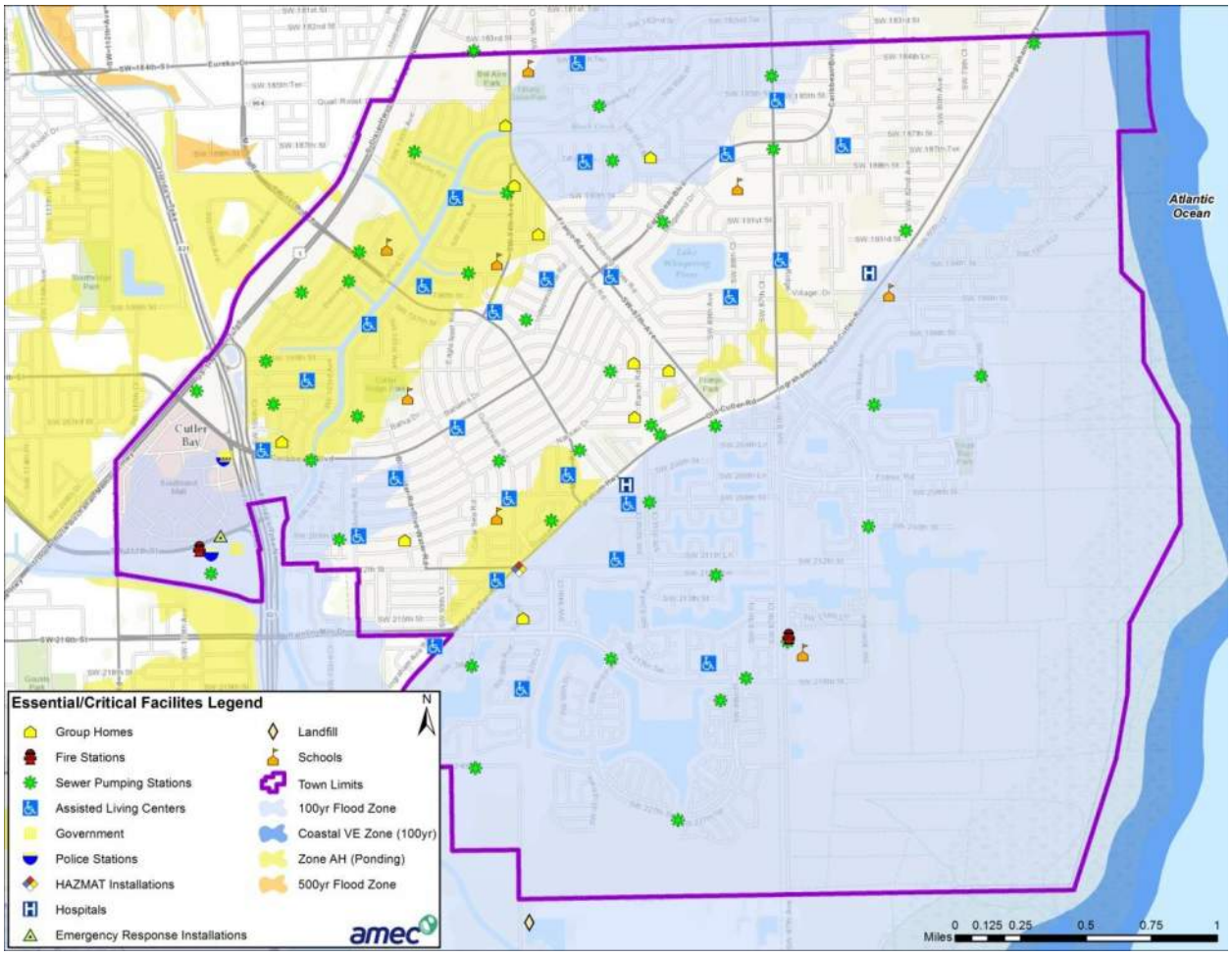


Figure 3.27 - Critical Facilities Located within FEMA Flood Zones

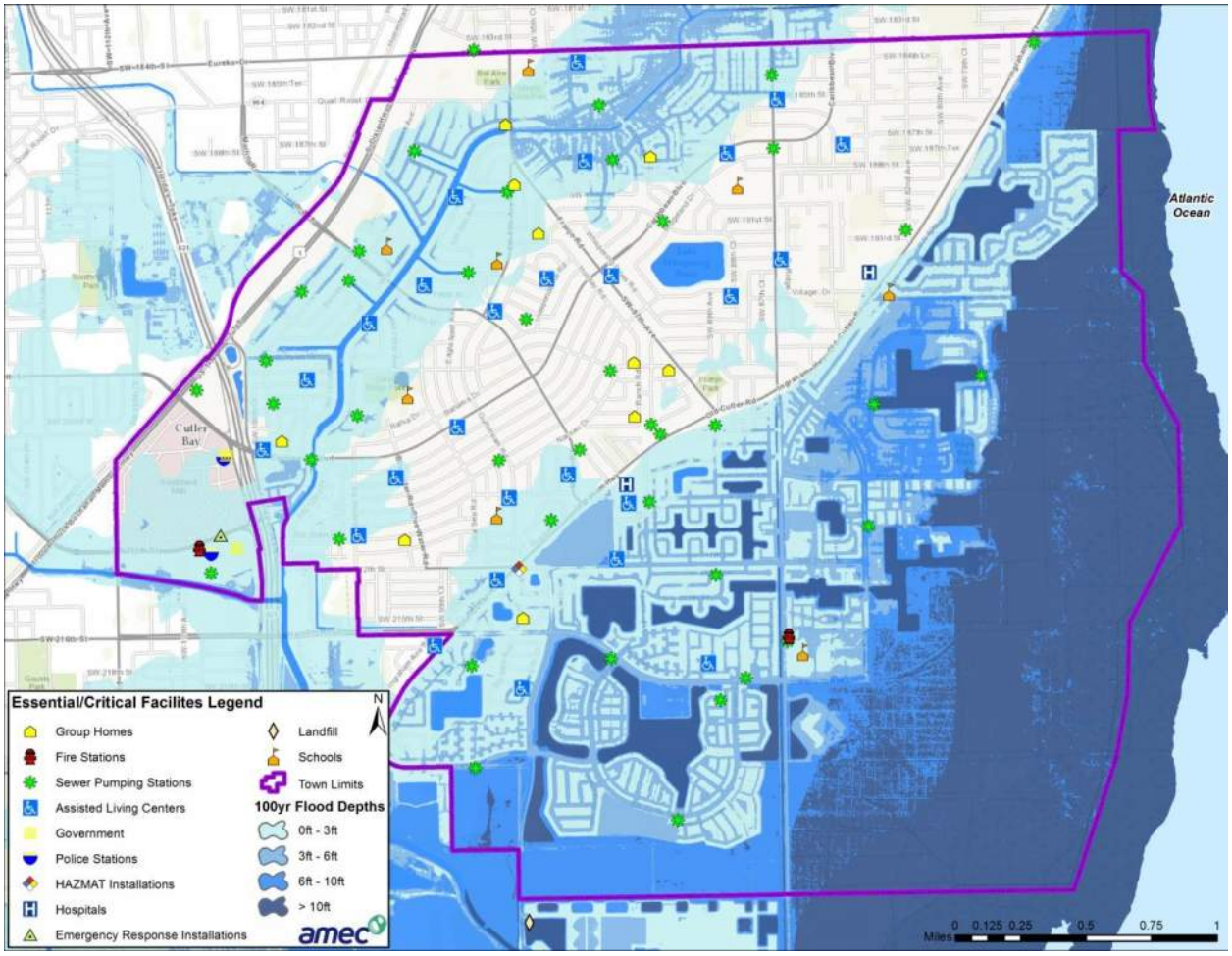


Figure 3.28 - Critical Facilities and 100-yr Flood Depths

Table 3.34 - Critical Facilities by Flood Zone

Facility	Facility Type	Address/Coordinates	Base Flood Elevation	Estimated Base Flood Depth (ft)
Whigham Elementary	School	21545 SW 87TH AVE	10	1.4
Whigham Learning Facility	School	8035 SW 196TH ST	10	1.8
Cutler Ridge Police Department	Police	10800 SW 211TH ST	8	-0.8
Health South	Hospital	20601 Old Cutler Road	8	-4.3
Sunrise Opp. Inc	Group Home	9031 SW 187TH TER	9	2.1
Sunrise Opp. Inc	Group Home	9765 SW 215TH LN	8	-2.7
Government Center	Government	10710 SW 211TH ST	8	-1.0
Miami-Dade Fire Rescue Station #34	Fire Station	10850 SW 211TH ST	8	1.7
Miami-Dade Fire Rescue Station #55	Fire Station	21501 SW 87TH AVE	10	2.4
Miami-Dade County Vehicle Maintenance and Fueling	Emergency Response	10740 SW 211TH ST	8	1.0
STATION # 0000	Pumping Station	25.5780418887, -80.335607265	8	-2.8

Facility	Facility Type	Address/Coordinates	Base Flood Elevation	Estimated Base Flood Depth (ft)
STATION # 0516	Pumping Station	25.5718213242, -80.358665971	8	0.4
STATION # 0517	Pumping Station	25.599175859, -80.316013918	11	-0.9
STATION # 0540	Pumping Station	25.5647702475, -80.3506026716	8	2.8
STATION # 0577	Pumping Station	25.5591182348, -80.3504109597	9	4.8
STATION # 0583	Pumping Station	25.5651354841, -80.3420700352	10	4.1
STATION # 0603	Pumping Station	25.5699842703, -80.3665117279	8	2.0
STATION # 0507	Pumping Station	25.5791569173, -80.325911715	11	7.0
STATION # 0609	Pumping Station	25.5807257714, -80.3193452238	12	7.1
STATION # 0610	Pumping Station	25.5724004713, -80.326280969	11	5.8
STATION # 0702	Pumping Station	25.562801377, -80.3353984572	10	2.1
STATION # 1046	Pumping Station	25.564029218, -80.333814522	10	4.1
STATION # 1096	Pumping Station	25.566043441, -80.3312723754	10	2.4
STATION # 0578	Pumping Station	25.5762412461, -80.3603545312	8	0.5
STATION # 1058	Pumping Station	25.5927725768, -80.3418306472	9	3.8
STATION # 1059	Pumping Station	25.5957996885, -80.3426335791	9	3.7
STATION # 1067	Pumping Station	25.5974283551, -80.3320636885	9	2.9
STATION # 1109	Pumping Station	25.569742077, -80.3356234062	10	4.1
STATION # 1111	Pumping Station	25.5561730858, -80.3380277234	10	1.1
STATION # 1119	Pumping Station	25.5738188941, -80.3396769694	8	2.3
Nuestro Hogar ALF, Inc.	Assisted Living	9384 SW 184TH TER	9	2.2
Paradise Villa	Assisted Living	21164 SW 92ND PL	9	2.4
Welcome Home Alf	Assisted Living	8950 SW 215TH TER	10	1.9
Blue Point Home Care	Assisted Living	21910 SW 97TH CT	9	2.7
Bertha Elderly Care	Assisted Living	10051 HAITIAN DR	8	0.9
Harmony Family Home	Assisted Living	9245 SW 208TH TER	8	1.2
Bell Luna Retirement Home	Assisted Living	18700 SW 93RD CT	9	2.6
Guardian Angel ALF	Assisted Living	10265 NICARAGUA DR	8	2.0
South Dade Landfill	Land Fill	23707 SW 97TH AVE	10	10.6
Florida City Gas Sub Station #3	Hazardous Materials	21210 SW 97TH CT	8	2.0
Bel-Aire Elementary	School	10205 SW 194TH ST	8	0.7
Gulfstream Elementary	School	20900 SW 97TH AVE	7	-0.1
Cutler Ridge Middle	School	19400 GULFSTREAM RD	7	-1.1
A Guardian Group Home	Group Home	9700 STERLING DR	9	2.5
All Care Residential	Group Home	18901 SW 97TH AVE	7	0.8
Cutler Bay Group Home	Group Home	10471 SW 204TH TER	8	-0.9
Sunrise Opp. Inc	Group Home	9500 SW 191ST TER	7	0.8
STATION # 0684	Pumping Station	25.5728159418, -80.3456865725	7	0.3
STATION # 0708	Pumping Station	25.5793439657, -80.3626482243	8	1.3
STATION # 1051	Pumping Station	25.5933140321, -80.3539410799	9	2.7
STATION # 1060	Pumping Station	25.5877828731, -80.357346647	8	0.7
STATION # 1052	Pumping Station	25.5861430145, -80.35800235	8	2.0
STATION # 1053	Pumping Station	25.5817407306, -80.363100133	8	2.3
STATION # 1054	Pumping Station	25.5910182764, -80.3482829249	7	0.8
STATION # 1055	Pumping Station	25.5865631643, -80.3506789532	7	1.5
STATION # 1057	Pumping Station	25.5786682255, -80.3575210256	7	2.8
STATION # 1064	Pumping Station	25.585540855, -80.3609082363	8	3.3
Living Well Alf	Assisted Living	21280 OLD CUTLER RD	8	0.8
Best ALF	Assisted Living	19010 BEL AIRE DR	7	2.1

Facility	Facility Type	Address/Coordinates	Base Flood Elevation	Estimated Base Flood Depth (ft)
Marlin Retirement	Assisted Living	20610 MARLIN RD	7	-0.7
Bel Aire Retirement Home	Assisted Living	9955 SW 196TH ST	7	0.5
The Haven	Assisted Living	10601 CARIBBEAN BLVD	8	0.4
Bertha Elderly Care #2	Assisted Living	10411 SW 200TH TER	8	-0.2
Roadesk One Inc.	Assisted Living	9700 MONTEGO BAY DR	7	0.2
Bel-View ALF Corp	Assisted Living	19768 BEL AIRE DR	7	1.5
Whispering Pines Elementary	School	18929 SW 89TH RD	0	0.0
Cutler Ridge Elementary	School	20210 CORAL SEA RD	0	0.0
Our Lady of the Holy Rosary	School	9500 SW 184 St	0	0.0
Cutler Bar Police Department	Police	10720 CARIBBEAN BLVD	0	0.0
Purdue Medical Center	Hospital	19590 OLD CUTLER RD	0	0.0
Campos Fleitas	Group Home	9010 SW 200TH ST	0	0.0
Lizi's Garden Group Home	Group Home	9220 NAUTILUS DR	0	0.0
Mains'L	Group Home	19930 HOLIDAY RD	0	0.0
Sierra Developmental Enterprises	Group Home	10030 NICARAGUA DR	0	0.0
Town Hall	Government	10720 CARIBBEAN BLVD	0	0.0
STATION # 0703	Pumping Station	25.5801111216, -80.3673550039	0	0.0
STATION # 0704	Pumping Station	25.5810698987, -80.3420264795	0	0.0
STATION # 0705	Pumping Station	25.583955011, -80.3471810578	0	0.0
STATION # 0744	Pumping Station	25.5767251636, -80.3439340344	0	0.0
STATION # 0750	Pumping Station	25.5775604992, -80.3389947083	0	0.0
STATION # 1074	Pumping Station	25.5888040764, -80.3239094689	0	0.0
STATION # 0701	Pumping Station	25.5761588458, -80.3488635508	0	0.0
STATION # 0706	Pumping Station	25.5933671459, -80.3319936837	0	0.0
STATION # 0707	Pumping Station	25.5893458306, -80.3387680387	0	0.0
STATION # 0734	Pumping Station	25.5780921499, -80.3395428582	0	0.0
STATION # 1063	Pumping Station	25.5988967107, -80.3502983712	0	0.0
Bel-Air Alf II Inc.	Assisted Living	19431 FRANJO RD	0	0.0
Genesis Care Centers	Assisted Living	8395 SW 187TH TER	0	0.0
Good Time Home Care	Assisted Living	8640 SW 185TH ST	0	0.0
Bel-Air ALF Inc.	Assisted Living	8830 CARIBBEAN BLVD	0	0.0
Precious Moments ALF	Assisted Living	9480 DANA RD	0	0.0
Kenneth Home Inc.	Assisted Living	9760 MEMORIAL RD	0	0.0
Old Cutler Retirement Home	Assisted Living	21640 OLD CUTLER RD	0	0.0
Whispering Pines Home Care	Assisted Living	8830 SW 196TH DR	0	0.0
Caribbean ALF	Assisted Living	9860 CARIBBEAN BLVD	0	0.0
East Ridge Retirement Village	Assisted Living	19301 SW 87TH AVE	0	0.0

Source: Miami-Dade County 2013 Tax Assessor's Data, FEMA 2009 DFIRM
Note: Depths derived from Miami-Dade County 2009 LiDAR Data

Policies and Procedures for Critical Facilities and Infrastructure

Many of the critical facilities and infrastructure in Cutler Bay are located within the 1% annual chance flood area (AE and AH-Zones). Some of these facilities have a depth of flooding which can create problems for the functionality of the building. Many of these facilities are privately owned such as assisted living centers which require the owner to either provide flood proofing or other retrofitting measures. Many of the facilities which are publically-owned don't have many options to be relocated,

since approximately 65% of the community is in a designated floodplain. The mitigation action plan identifies a specific measure to protect vulnerable critical facilities.

Future Development

A GIS analysis was performed to quantify parcels within future development areas that are located within a special flood hazard area.

Methodology

The 2013 Miami-Dade County's parcel layer was used to identify potential areas of future development located within FEMA flood zones. Parcel counts by FEMA flood zone were determined using a spatial intersection of the tax parcels and the effective flood hazard area provided in the Miami-Dade County FEMA DFIRM Database, effective 9/11/2009. In the event that a parcel was affected by multiple zones, the flood zone covering the majority of the parcel was assigned to the parcel. Table 3.35 delineates the future development areas by flood zone and land use.

Table 3.35 - Future Land Use and FEMA Flood Zones

Future Land Use	Unimproved Parcel Count	Land Value
Zone AE		
Residential	23	$565,104
Commercial	1	$0
Education	0	$0
Government	64	$23,875,078
Religious	0	$0
Other	373	$36,770,011
Total	**461**	**$61,210,193**
Zone VE		
Residential	0	$0
Commercial	0	$0
Education	0	$0
Government	2	$40,000
Religious	0	$0
Other	0	$0
Total	**2**	**$40,000**
Zone AH		
Residential	0	$0
Commercial	0	$0
Education	0	$0
Government	1	$16,465
Religious	0	$0
Other	85	$2,684,398
Total	**86**	**$2,700,863**
Zone X		
Residential	0	$0
Commercial	1	$0
Education	0	$0
Government	7	$449,820
Religious	0	$0
Other	101	$10,359,376
Total	**109**	**$10,809,196**

Source: Miami-Dade County 2013 Tax Assessor's Data, FEMA 2009 DFIRM, Cutler Bay Future Land Use Data

Flood Insurance Analysis

One valuable source of information on flood hazards is current flood insurance data for activity policies and past claims. Flood insurance is required as a condition of federal aid or a mortgage or loan that is federally insured for a building located in a FEMA flood zone. Figure 3.29 shows the location of active flood insurance policies as well as policies with claims.

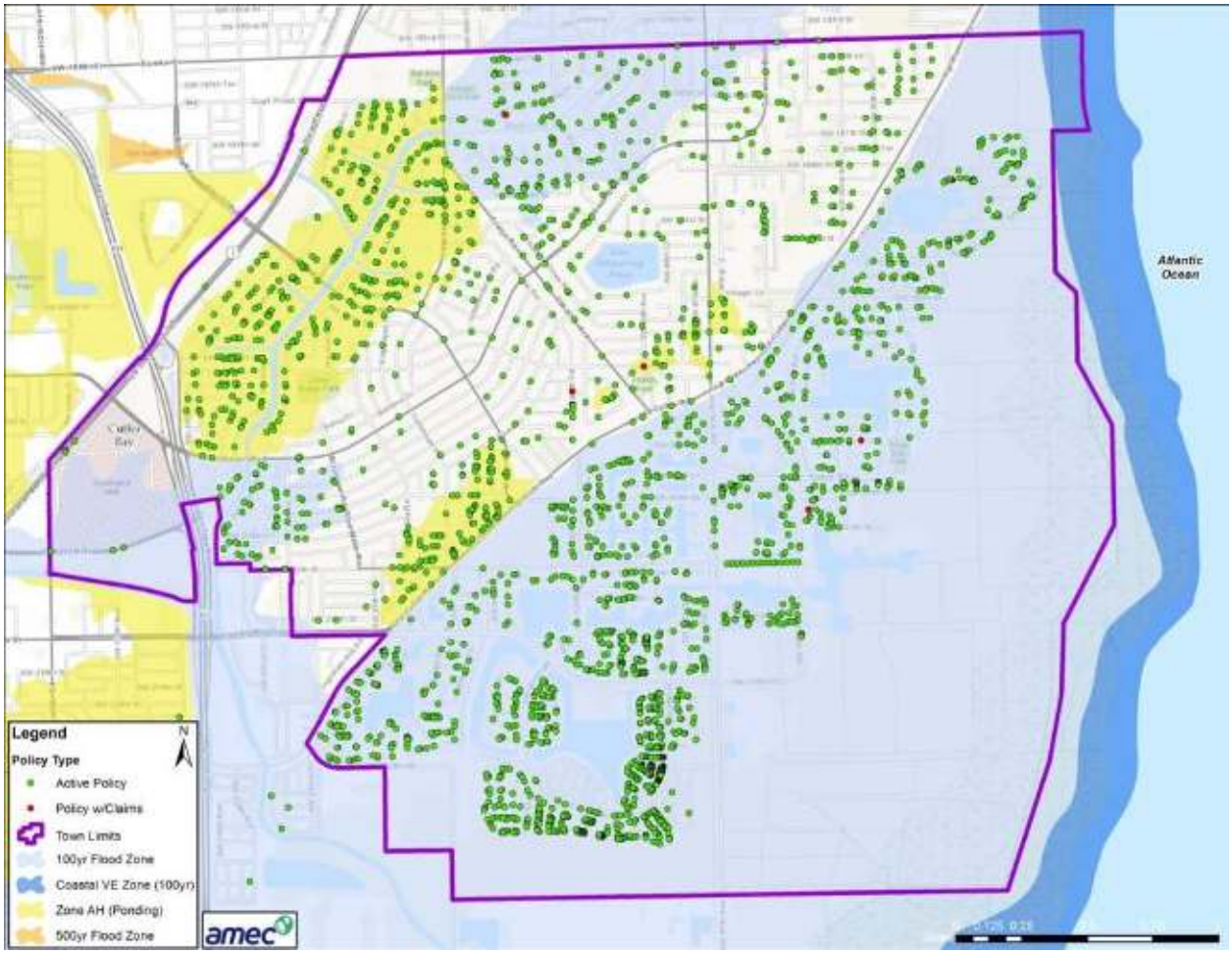


Figure 3.29 - Cutler Bay Flood Insurance Policies in Force

Table 3.36 summarizes key statistics of policies in force and past claims by flood zone.

Table 3.36 - NFIP Policy and Claims Data by Flood Zone

Flood Zone	Number of Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
A01-30 & AE Zones	2,482	$1,433,176	$517,974,300	1	$6,388
AH Zones	535	$196,197	$127,246,300	1	$37,858
V01-30 & VE Zones	0	$0	$0	0	$0
B, C & X Zone	0	$0	$0	0	$0

Flood Zone	Number of Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
Standard	5	$5,990	$1,223,300	1	$46,367
Preferred	303	$119,419	$86,823,000	1	$37,327
Total	**3,325**	**$1,754,782**	**$733,266,900**	**4**	**$127,940**

Source: FEMA Community Information System, April 2014

Table 3.37 compares the number of policies in force with the number of buildings located within each flood zone in order to examine the percentage of buildings that are insured within each zone.

Table 3.37 - Percentage of Buildings Insured

Flood Zone	Number of Policies in Force	Number of Buildings	% Insured
AE Zone	2,482	7,402	33.5%
AH Zone	535	1,761	30.4%
VE Zone	0	0	0%
X Zone	308	3,535	8.7%
Total	**3,325**	**12,698**	**26.2%**

Source: FEMA Community Information System, April 2014

The notable statistic in Table 3.37 is that while there are 9,163 buildings located within the 100-yr flood zone (AE, AH and VE Zones), only 33% of these buildings carry an active flood insurance policy. Furthermore, only 9% of buildings within the X Zone are insured, and as the repetitive loss figures show below, flooding is not limited to the 100-yr flood zones.

Table 3.38 compares number of buildings present, number of policies in force, total coverage and a calculation of loss estimate values for the 100-yr flood.

Table 3.38 - Flood Loss Estimates by Flood Zone

Flood Zone	Number of Buildings	Number of Policies in Force	Total Value[1]	Total Coverage	Loss Estimate
AE Zone	7,402	2,482	$1,281,223,491	$517,974,300	$274,693,655
AH Zone	1,761	535	$342,026,222	$127,246,300	$23,582,217
VE Zone	0	0	$0	$0	$0
Total	**9,163**	**3,017**	**$1,623,249,713**	**$645,220,600**	**$298,275,872**

Source: Miami-Dade County 2013 Tax Assessor's Data, FEMA 2009 DFIRM

[1]Total value does not include land value.

The above analysis of existing flood insurance coverage shows that existing building coverage does exceed the loss estimate for the 100-yr flood zone; however, this statistic does not take into account the large number of uninsured proprieties (67%) that would have no coverage in the event of a flood loss. Total building content value within the 100-yr flood zone is estimated at $603,428,166. An analysis of NFIP data through December 2011 showed active policies with building contents coverage totaling $56,094,000.

Repetitive Loss Analysis

An analysis of repetitive loss was completed to examine repetitive loss properties against FEMA flood zones. All 16 unmitigated repetitive loss properties located within the Town of Cutler Bay are residential.

Methodology

According to 2014 NFIP records, there is one mitigated property with a total payment of $25,945 and 32 unmitigated properties with a total payment of $1,816,483 with the Town of Cutler Bay. Table 3.39 details repetitive loss building counts, FEMA flood zones and total payment.

Table 3.39 - Repetitive Loss Summary Table (Unmitigated Properties)

Flood Zone	Building Count		Total Building Payment	Total Content Payment	Total Paid
	Insured	Uninsured			
AE	9	13	$627,757	$281,284	$909,041
AH	1	0	$60,925	$24,443	$85,369
A10	1	0	$28,856	$0	$28,856
X	5	3	$516,088	$277,129	$793,217
Total	**16**	**16**	**$1,233,626**	**$582,856**	**$1,816,483**

Source: NFIP Repetitive Loss Data 2014

Figure 3.30 illustrates the location of the repetitive loss properties separated out by the classification of mitigated or unmitigated in relation to the known flood hazard areas within Cutler Bay. Figure 3.31 illustrates the location of these properties in relation to the 100-yr flood depth.

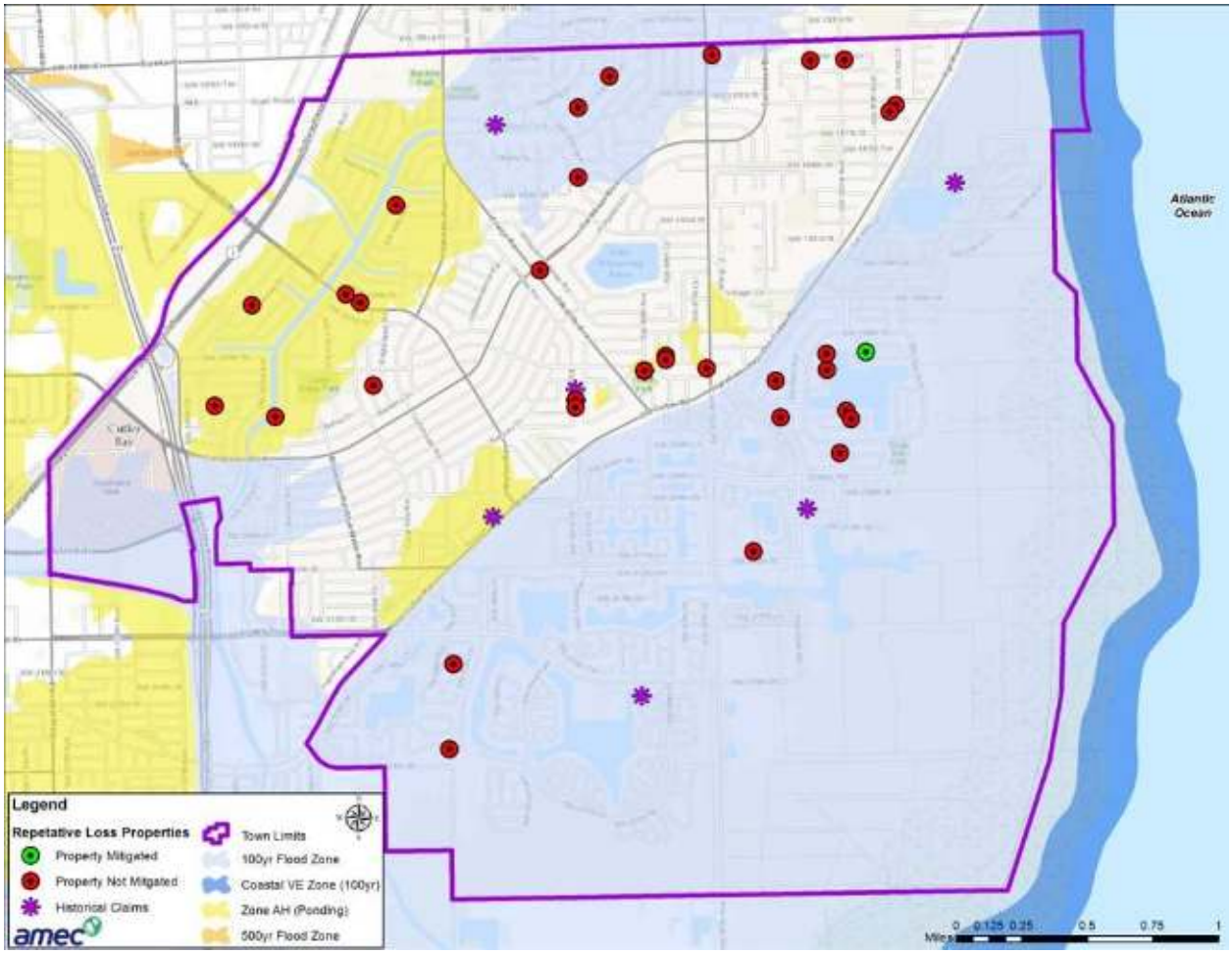


Figure 3.30- Repetitive Loss Properties and Flood Zones

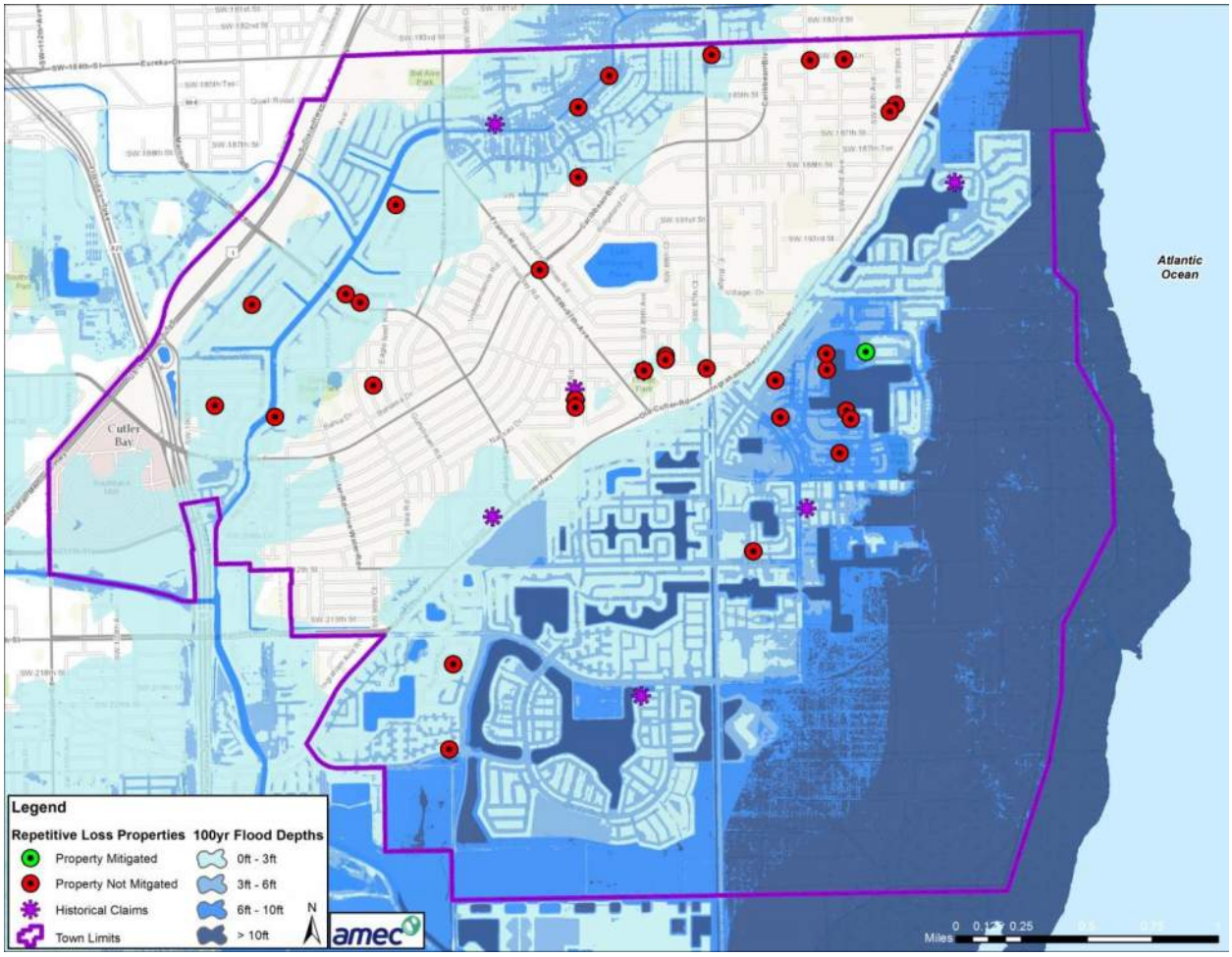


Figure 3.31 - Repetitive Loss Properties and 100-yr Flood Depth

3.3.5 Flood: Stormwater/Localized Flooding Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely
Vulnerability—Medium

Localized flooding also occurs at various times throughout the year with several areas of primary concern to the Town. Localized flooding and ponding affect streets and property. Based on figure 3.32, there appears to be a correlation between areas of localized stormwater flooding and repetitive loss properties. Stormwater and localized flooding can often be attributed to the 100-year (1% annual chance flood) and some of the assets identified in Section 3.3.4 can be impacted from localized stormwater flooding. No direct damage of insurable buildings (other than potentially repetitive loss single-family structures) have been identified as being damaged by localized stormwater flooding. Areas of localized flooding identified by the FMPC are summarized below:

- Sterling Dr and SW 93 St
- Parcels between SW 195 St and SW 196 St
- The parcels bordered by Caribbean Blvd, Anchor Rd, Pan American Dr and Blue Water Rd
- Manta Drive at Old Cutler Rd
- Old Cutler Rd southwest of the intersection of Franjo Rd
- The intersection of SW 89 Ct, Franjo Rd and SW 200 St

- SW 186 St at SW 97th Avenue
- SW 77 Ave and SW 188 St through the intersection of SW 78 Ave
- SW 79 Ave at SW 79 Ct
- SW 197 Terrace at SW 196 Terrace
- SW 84 Ave at SW 199 Terrace
- SW 212 St between SW 85 Ave and SW 87 Ave
- SW 92 Ave between Old Cutler Road and SW 208 St
- SW 24 Terrace between SW 97 Ct and SW 97 Pl
- SW 216 St between SW 97 Ave and SW 98 Ct
- SW 97 Ave between SW 219 St and SW 224 St
- The quadrant of parcels bordered by SW 97 Ave, SW 221 Street/Terrace, SW 99 Pl and SW 224 St
- The intersection of SW 92 Ave/SW 93 Path and SW 216 St
- Parcels between SW 216 St and the eastern portion of SW 215 Terrace
- SW 216 St between SW 87 Pl and SW 88 Pl

Figure 3.32 depicts localized flooding, repetitive loss areas and flood zones. Figure 3.33 depicts localized flooding, repetitive loss areas and the depth of flooding that can be expected from the 100-yr flood event. The impacts to insurable buildings, infrastructure, and other assets are identified in Section 3.3.4.

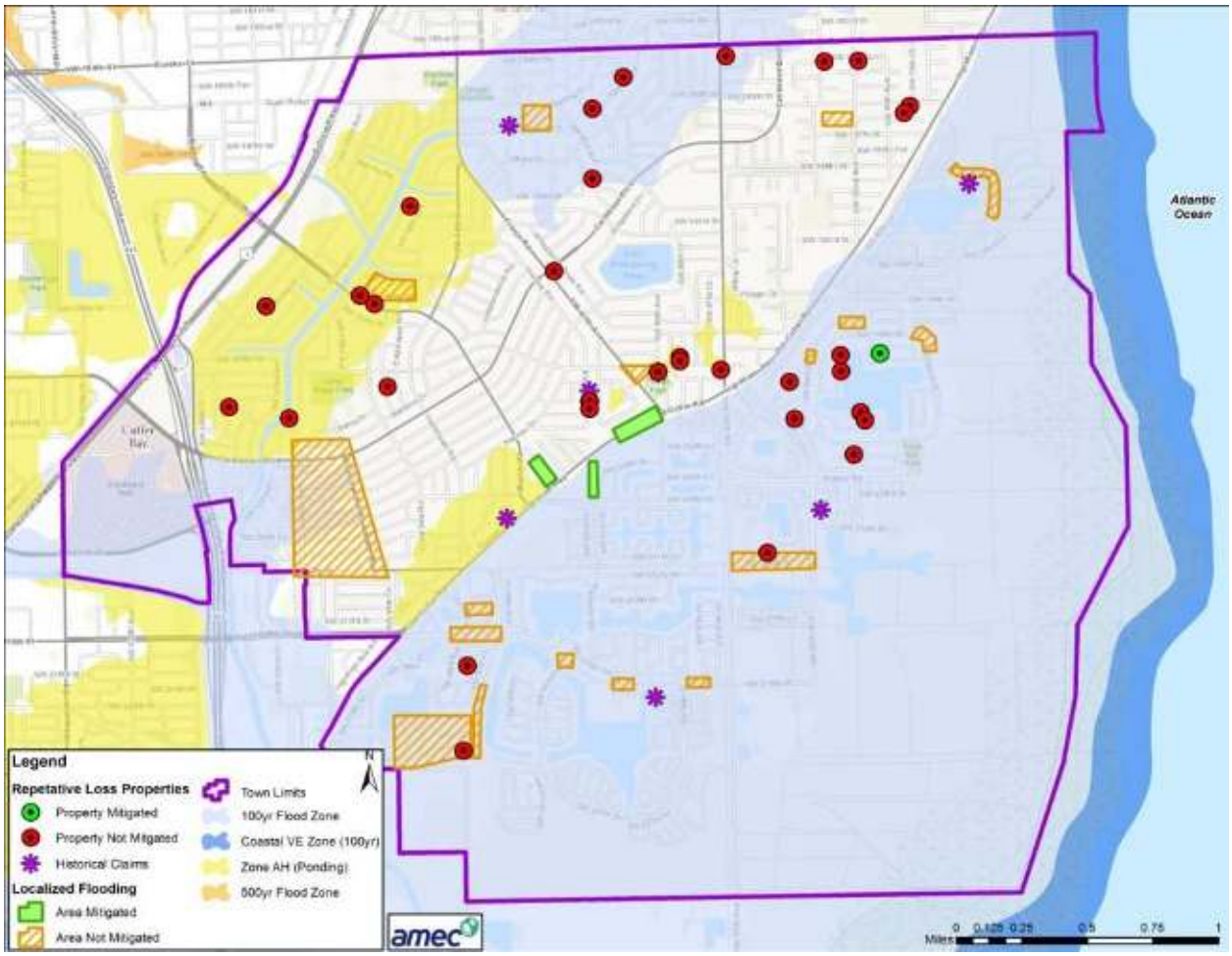


Figure 3.32- Localized Flooding, Repetitive Loss Areas and Flood Zones

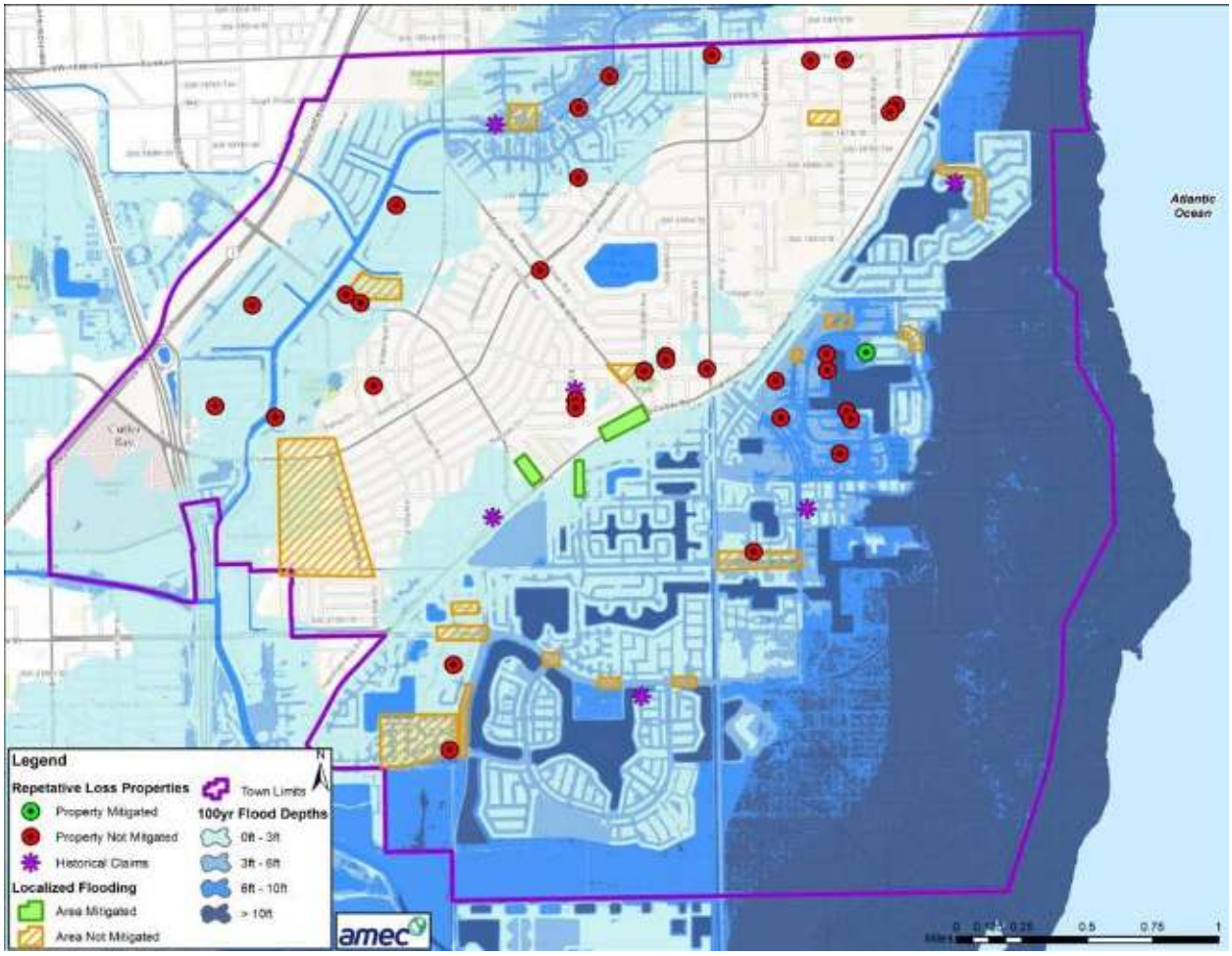


Figure 3.33 - Repetitive Loss, Localized Flooding and 100-yr Flood Depth

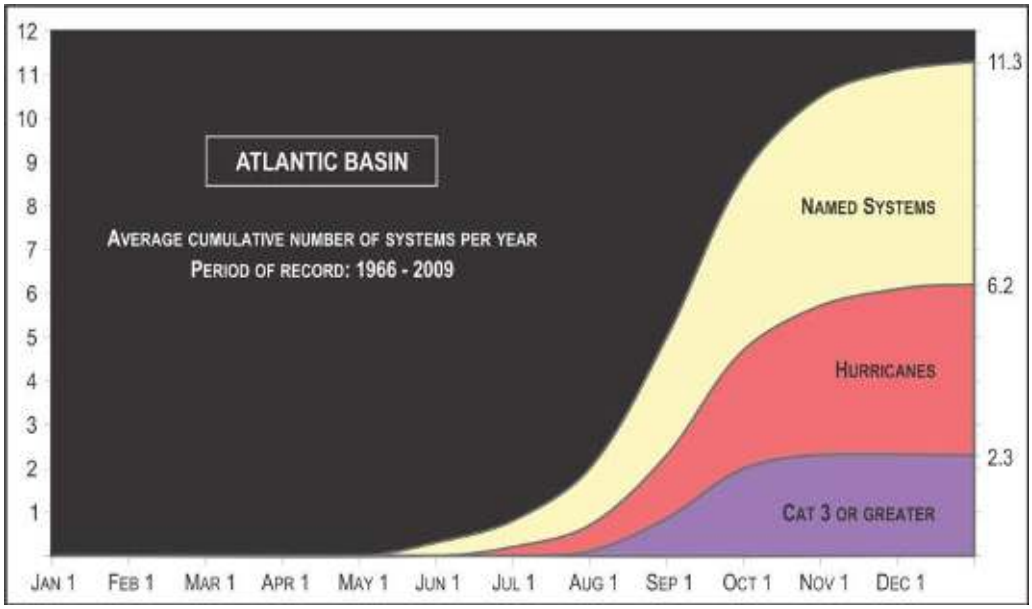
3.3.6 Hurricane and Tropical Storm Vulnerability Assessment

Likelihood of Future Occurrence—Likely
Vulnerability—High

The heavy rains associated with tropical weather systems are not only responsible for major flooding in areas where the storm initially strikes, but can also affect areas hundreds of miles inland. Torrential rains from hurricanes and tropical storms can produce extensive urban and riverine flooding, especially if the storm systems are large and slow moving. Winds from these storms located offshore can drive ocean water up the mouth of a river or canal, compounding the severity of inland overbank flooding.

In addition to the combined destructive forces of wind, rain, and lightning, hurricanes can cause a surge in the ocean, which can raise the sea level as high as 25 feet or more in the strongest hurricanes. As a hurricane approaches the coast, its winds drive water toward the shore. Once the edge of the storm reaches the shallow waters of the continental shelf, the water begins to pile up. Winds of hurricane strength eventually force the water onto the shore. At first, the water level climbs slowly, but as the eye of the storm approaches, water rises rapidly. Furthermore, storm surge can also cause extensive damage on the backside of a hurricane as storm surge waters are sucked back out to sea.

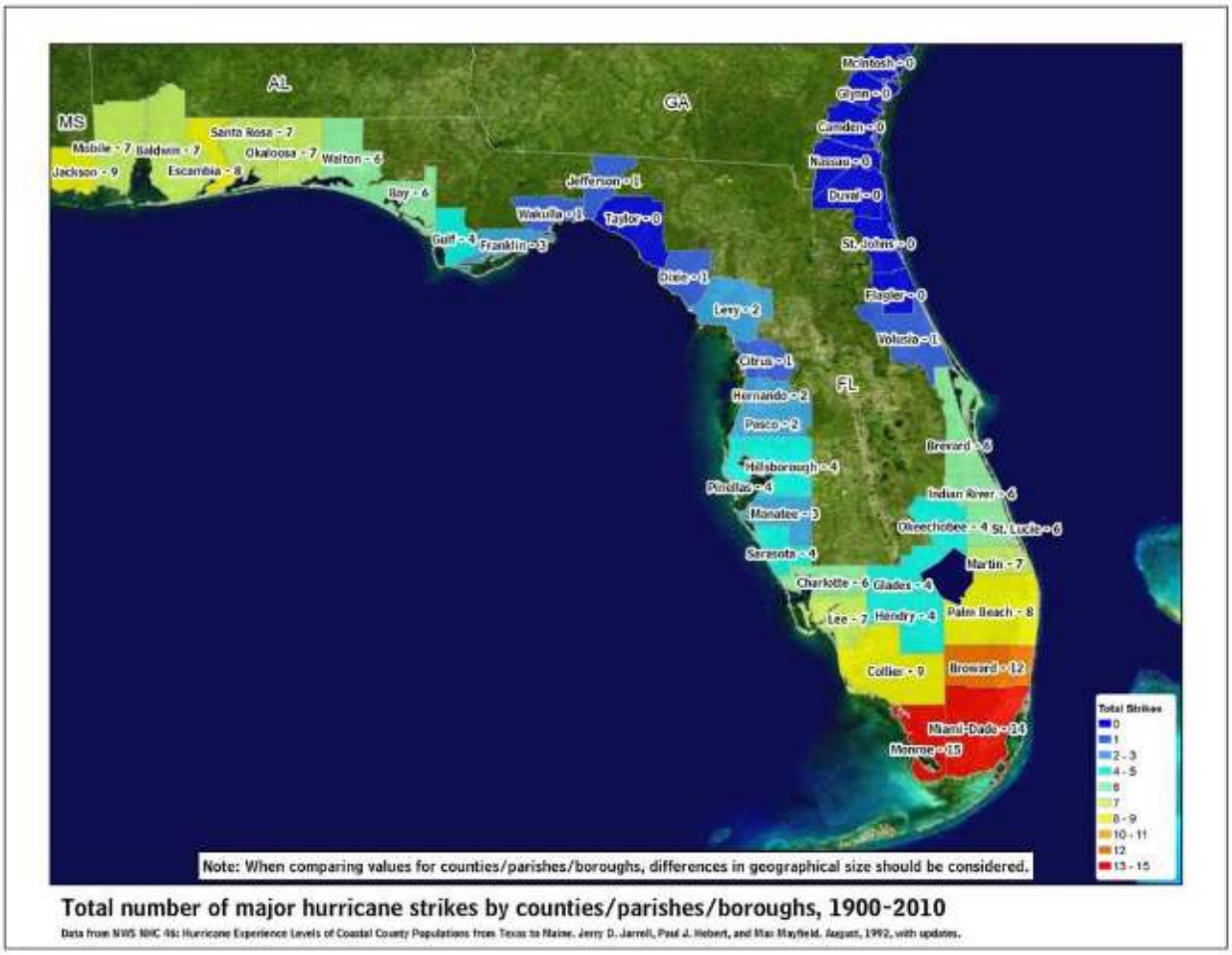
The Atlantic hurricane season runs from June 1st to November 30th. The Atlantic basin includes the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico. Figure 3.34 shows the progress of a typical hurricane season in terms of the total number of tropical systems and hurricanes produced throughout the year in the Atlantic basin. The curves represent the average cumulative production of all named tropical systems, all hurricanes, and those hurricanes which were Category 3 or stronger in those basins.



Source: NOAA/National Hurricane Center

Figure 3.34 – Average Number of Tropical Storms Per Year (Atlantic Basin)

Figure 3.35 represents the average number of hurricane strikes for Miami-Dade County from 1900-2010.



Source: NOAA/National Hurricane Center

Figure 3.35 – Major Hurricane Strikes – Miami-Dade County

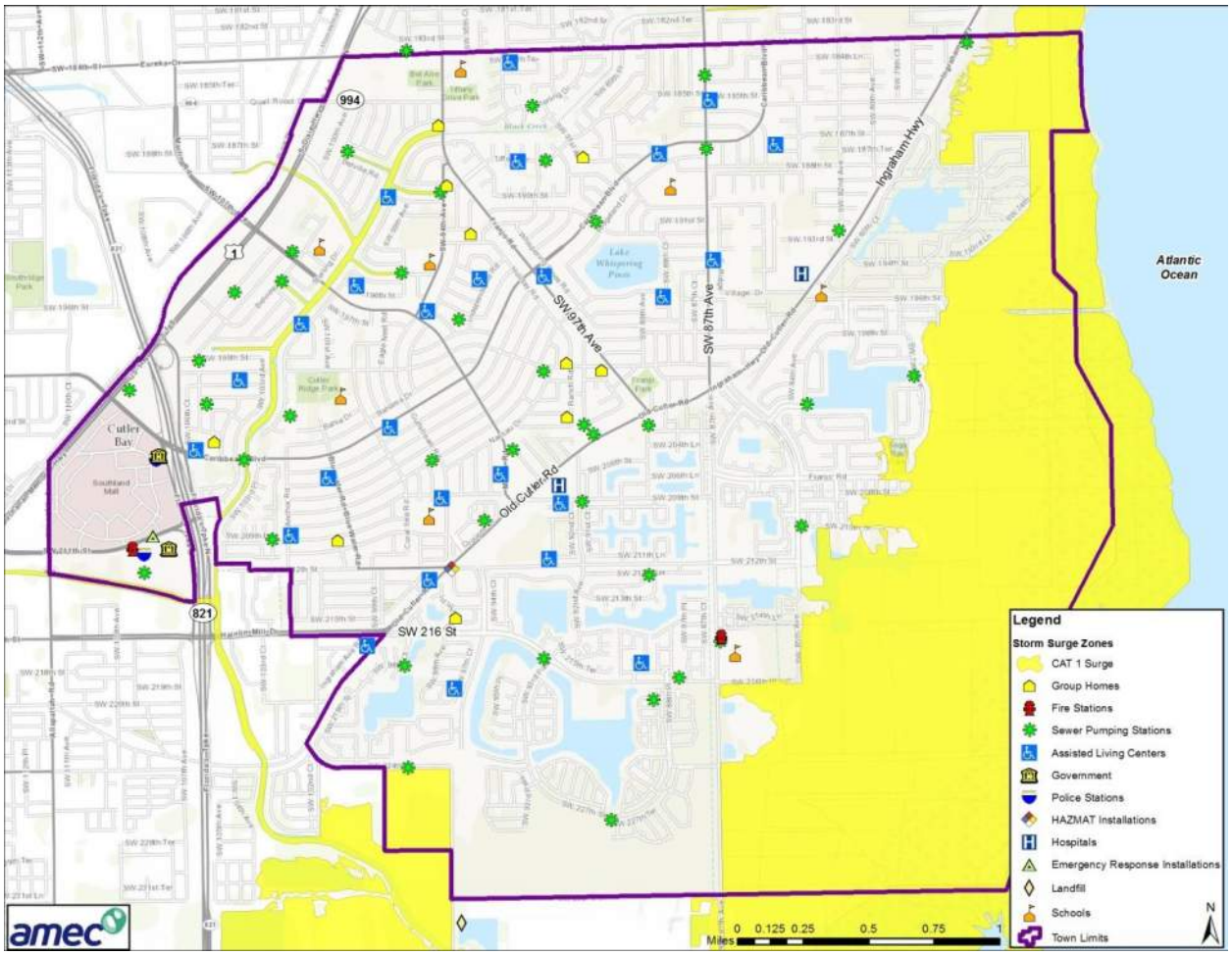
Methodology

A hurricane surge analysis was conducted by intersecting the parcel layer provided by Miami-Dade County with the polygon shapefile for each hurricane surge layer. The polygon shapefiles depicting each hurricane surge zone were created using a Surge Modeling application created for the Florida Statewide Regional Evacuation Update Study. The data was derived from National Hurricane Center SLOSH model runs on all the NOAA SLOSH basins throughout Florida. The runs create outputs for all different storm simulations from all points of the compass. Each direction has a MEOW (maximum envelope of water) for each category of storm (1-5), and all directions combined result in a MOMs (maximum of maximums) set of data. The MOMs are used in this surge model. The application uses three input parameters or data: elevation (from LIDAR), SLOSH basin results, and contiguous shoreline or sea polygons.

Assets at Risk

Figures 3.36 through 3.40 and Tables 3.40 through 3.44 provide a summary of assets at risk to hurricane surge based on each hurricane category. The assets at risk estimate for each hurricane category is based on the total of improved and contents value. The value of land is not included in the loss estimates as generally the land is not subject to loss from hurricane and tropical storm damage. When compared to the

vulnerability of predicted flood level models (SLOSH) resulting from hurricane storm surge, almost the entire Town becomes vulnerable to property damaging flooding from a Category 3 or stronger hurricane. Based on NOAA's Storm Surge Inundation (SLOSH Maximum of Maximums – worst case including high tide) Mapping concludes that in a category 1 hurricane, Cutler Bay can expect up to 3 feet of surge.



Source: Florida Division of Emergency Management (http://www.floridadisaster.org)

Figure 3.36 - Category 1 Storm Surge Impact in Cutler Bay

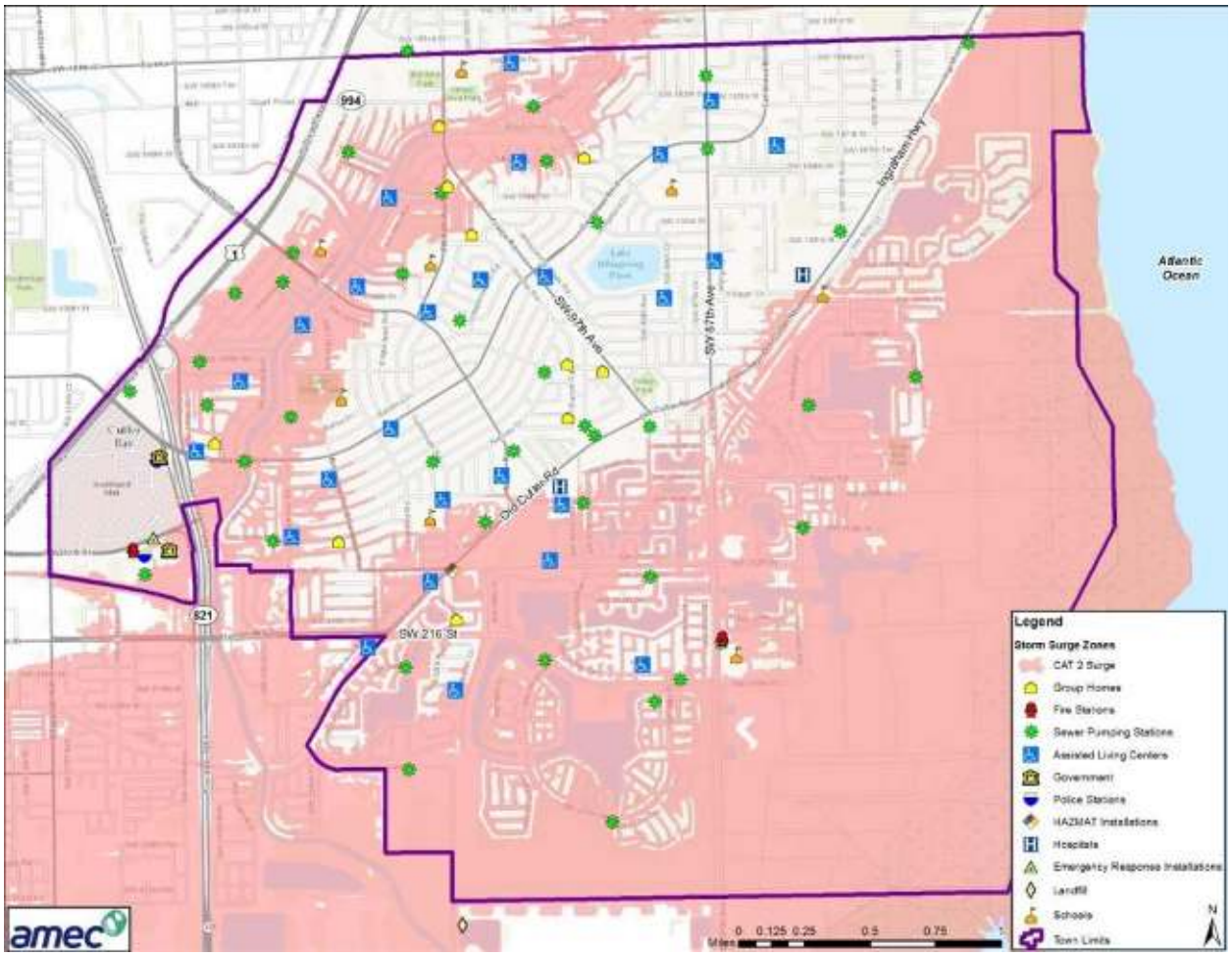
Table 3.40 – Cutler Bay Assets at Risk to Category 1 Storm Surge

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value[1]
Residential	131	131	$10,088,847	$36,473,796	$18,236,898	$54,710,694
Commercial	0	0	$0	$0	$0	$0
Education	0	0	$0	$0	$0	$0
Government	50	2	$32,322,041	$8,043,297	$8,043,297	$16,086,594
Religious	0	0	$0	$0	$0	$0
Other	113	0	$10,552,203	$28,264	$28,264	$56,528
Total	**294**	**133**	**$52,963,091**	**$44,545,357**	**$26,308,459**	**$70,853,816**

Source: Miami-Dade County 2013 Tax Assessor's Data, NOAA, FDEM

[1]Total value does not include land value.

In a category 2 hurricane, Cutler Bay can expect greater than 3 feet (but less than 6 feet) of storm surge based on NOAA's Storm Surge Inundation Mapping.



Source: Florida Division of Emergency Management (http://www.floridadisaster.org)

Figure 3.37 - Category 2 Storm Surge Impact in Cutler Bay

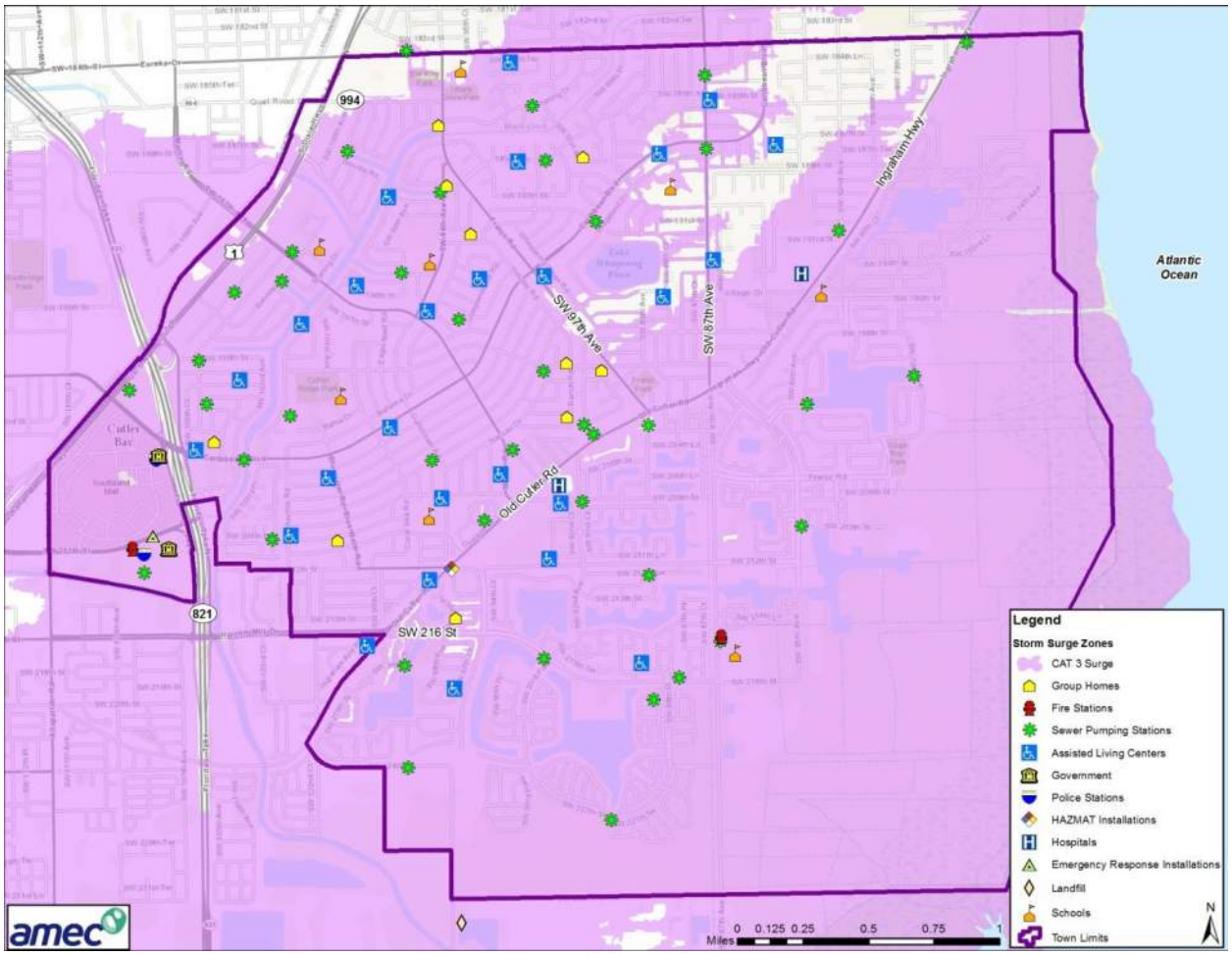
Table 3.41 - Cutler Bay Assets at Risk to Category 2 Storm Surge

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value[1]
Residential	8,394	8,371	$225,410,153	$775,162,872	$387,581,436	$1,162,744,308
Commercial	13	12	$27,537,135	$14,216,393	$14,216,393	$28,432,786
Education	9	9	$12,322,287	$42,153,052	$42,153,052	$84,306,104
Government	77	10	$46,475,637	$35,654,656	$35,654,656	$71,309,312
Religious	6	6	$6,511,468	$11,265,018	$11,265,018	$22,530,036
Other	461	6	$51,115,775	$14,339,906	$21,153,079	$35,492,985
Total	**8,960**	**8,414**	**$369,372,455**	**$892,791,897**	**$512,023,634**	**$1,404,815,531**

Source: Miami-Dade County 2013 Tax Assessor's Data, NOAA, FDEM

[1]Total value does not include land value.

In a category 3 hurricane, Cutler Bay can expect greater than 6 feet of storm surge based on NOAA's Storm Surge Inundation Mapping.



Source: Florida Division of Emergency Management (http://www.floridadisaster.org)

Figure 3.38 - Category 3 Storm Surge Impact in Cutler Bay

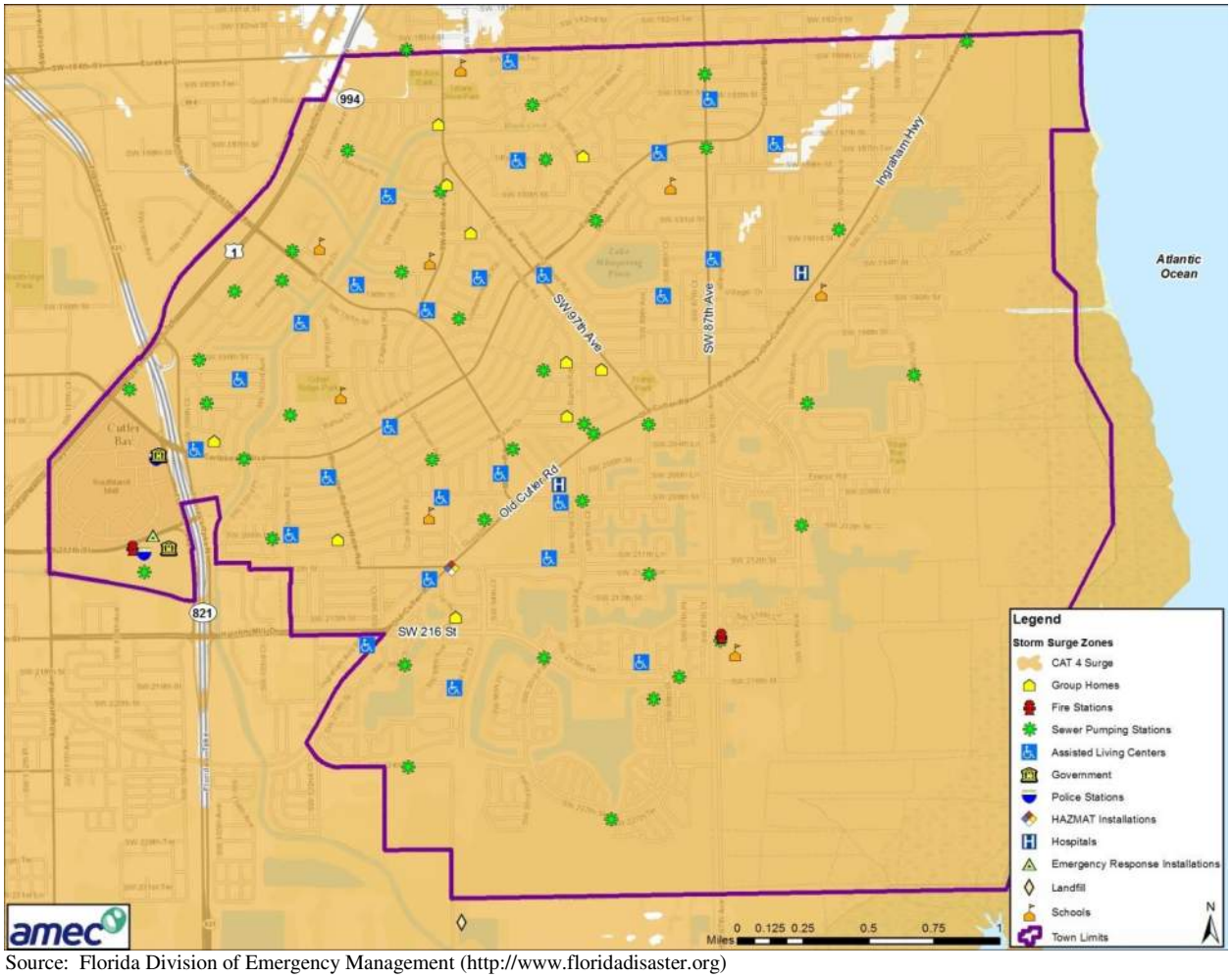
Table 3.42 - Cutler Bay Assets at Risk to Category 3 Storm Surge

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value[1]
Residential	12,307	12,284	$380,025,456	$1,147,291,683	$573,645,842	$1,720,937,525
Commercial	80	78	$129,608,965	$79,413,481	$79,413,481	$158,826,962
Education	10	10	$15,522,287	$47,013,077	$47,013,077	$94,026,154
Government	86	13	$49,411,117	$36,347,156	$36,347,156	$72,694,312
Religious	8	8	$7,175,576	$12,534,413	$12,534,413	$25,068,826
Other	579	28	$82,701,470	$29,774,601	$41,723,388	$71,497,989
Total	**13,070**	**12,421**	**$664,444,871**	**$1,352,374,411**	**$790,677,357**	**$2,143,051,768**

Source: Miami-Dade County 2013 Tax Assessor's Data, NOAA, FDEM

[1]Total value does not include land value.

In a category 4 hurricane, Cutler Bay can expect up to 9 feet of storm surge based on NOAA's Storm Surge Inundation Mapping



Source: Florida Division of Emergency Management (http://www.floridadisaster.org)

Figure 3.39 - Category 4 Storm Surge Impact in Cutler Bay

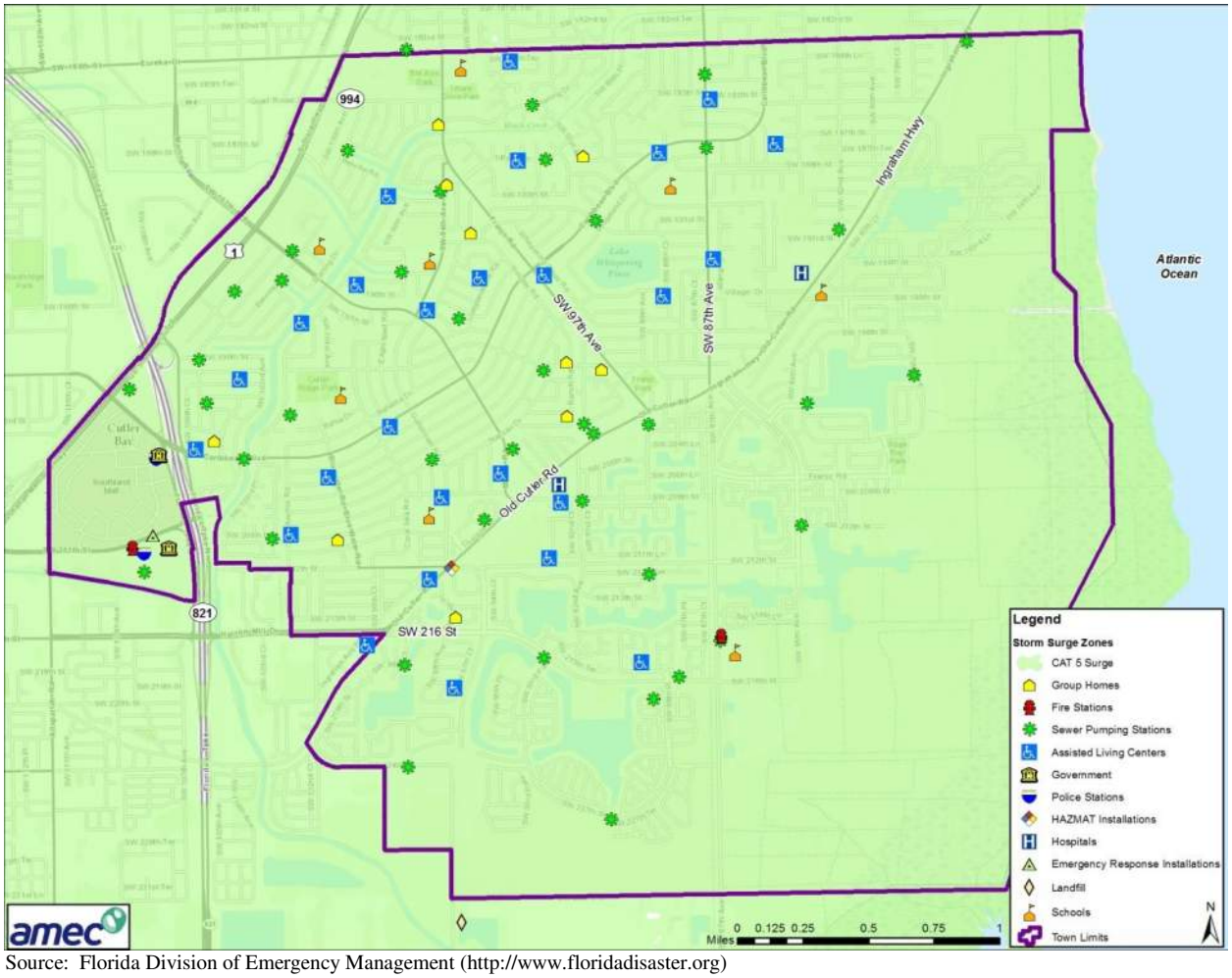
Table 3.43 - Cutler Bay Assets at Risk to Category 4 Storm Surge

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value[1]
Residential	12,570	12,547	$396,851,782	$1,197,267,361	$598,633,681	$1,795,901,042
Commercial	86	84	$133,843,386	$83,764,330	$83,764,330	$167,528,660
Education	10	10	$15,522,287	$47,013,077	$47,013,077	$94,026,154
Government	87	13	$49,412,594	$36,347,156	$36,347,156	$72,694,312
Religious	8	8	$7,175,576	$12,534,413	$12,534,413	$25,068,826
Other	590	31	$85,073,136	$30,292,386	$42,500,066	$72,792,452
Total	**13,351**	**12,693**	**$687,878,761**	**$1,407,218,723**	**$820,792,722**	**$2,228,011,445**

Source: Miami-Dade County 2013 Tax Assessor's Data, NOAA, FDEM

[1]Total value does not include land value.

In a Category 5 hurricane, Cutler Bay can expect over 9 feet of storm surge based on NOAA's Storm Surge Inundation Mapping.



Source: Florida Division of Emergency Management (http://www.floridadisaster.org)

Figure 3.40 - Category 5 Storm Surge Impact in Cutler Bay

Table 3.44 - Cutler Bay Assets at Risk to Category 5 Storm Surge

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value[1]
Residential	12,575	12,552	$397,212,144	$1,198,688,315	$599,344,158	$1,798,032,473
Commercial	86	84	$133,843,386	$83,764,330	$83,764,330	$167,528,660
Education	10	10	$15,522,287	$47,013,077	$47,013,077	$94,026,154
Government	87	13	$49,412,594	$36,347,156	$36,347,156	$72,694,312
Religious	8	8	$7,175,576	$12,534,413	$12,534,413	$25,068,826
Other	590	31	$85,073,136	$30,292,386	$42,500,066	$72,792,452
Total	**13,356**	**12,698**	**$688,239,123**	**$1,408,639,677**	**$821,503,199**	**$2,230,142,876**

Source: Miami-Dade County 2013 Tax Assessor's Data, NOAA, FDEM

[1]Total value does not include land value.

Table 3.45 provides an overall summary of parcels at risk in the Town by hurricane category.

Table 3.45 – Overall Summary of Cutler Bay Assets at Risk to Storm Surge

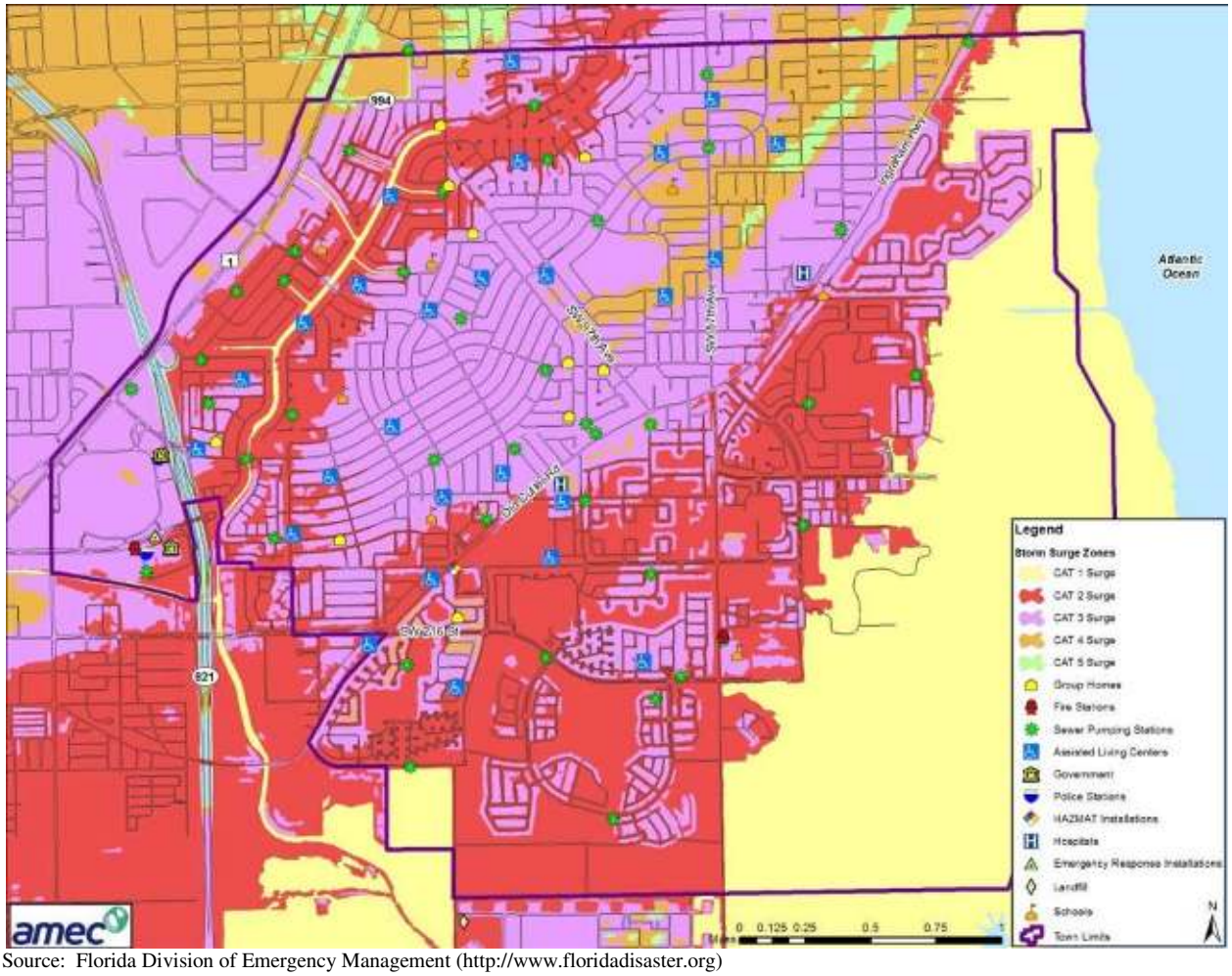
Hurricane Category	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value[1]
1	294	133	$52,963,091	$44,545,357	$26,308,459	$70,853,816
2	8,960	8,414	$369,372,455	$892,791,897	$512,023,634	$1,404,815,531
3	13,070	12,421	$664,444,871	$1,352,374,411	$790,677,357	$2,143,051,768
4	13,351	12,693	$687,878,761	$1,407,218,723	$820,792,722	$2,228,011,445
5	13,356	12,698	$688,239,123	$1,408,639,677	$821,503,199	$2,230,142,876

Source: Miami-Dade County 2013 Tax Assessor's Data, NOAA, FDEM

[1]Total value does not include land value.

Critical Facilities at Risk

Figure 3.41 and Tables 3.46 and 3.47 provide an overall summary of critical facilities at risk due to storm surge from a Category 1 through a Category 5 hurricane.



Source: Florida Division of Emergency Management (http://www.floridadisaster.org)

Figure 3.41 – Cutler Bay Storm Surge Impact (Category 1-5)

Table 3.46 - Cutler Bay Critical Facilities at Risk by Storm Surge Category

Facility	Address	CAT 1	CAT 2	CAT 3	CAT 4	CAT 5
Bel Aire Retirement Home	9955 SW 196TH ST	No	No	Yes	Yes	Yes
Bel-Air Alf II Inc.	19431 FRANJO RD	No	No	Yes	Yes	Yes
Bel-Air ALF Inc.	8830 CARIBBEAN BLVD	No	No	No	Yes	Yes
Bell Luna Retirement Home	18700 SW 93RD CT	No	No	Yes	Yes	Yes
Bel-View ALF Corp	19768 BEL AIRE DR	No	Yes	Yes	Yes	Yes
Bertha Elderly Care	10051 HAITIAN DR	No	No	Yes	Yes	Yes
Bertha Elderly Care #2	10411 SW 200TH TER	No	No	Yes	Yes	Yes
Best ALF	19010 BEL AIRE DR	No	Yes	Yes	Yes	Yes
Blue Point Home Care	21910 SW 97TH CT	No	Yes	Yes	Yes	Yes
Caribbean ALF	9860 CARIBBEAN BLVD	No	No	Yes	Yes	Yes
East Ridge Retirement Village	19301 SW 87TH AVE	No	No	No	Yes	Yes
Genesis Care Centers	8395 SW 187TH TER	No	No	No	No	Yes
Good Time Home Care	8640 SW 185TH ST	No	No	Yes	Yes	Yes
Guardian Angel ALF	10265 NICARAGUA DR	No	Yes	Yes	Yes	Yes
Harmony Family Home	9245 SW 208TH TER	No	No	Yes	Yes	Yes
Kenneth Home Inc.	9760 MEMORIAL RD	No	No	Yes	Yes	Yes
Living Well Alf	21280 OLD CUTLER RD	No	Yes	Yes	Yes	Yes
Marlin Retirement	20610 MARLIN RD	No	No	Yes	Yes	Yes
Nuestro Hogar ALF, Inc.	9384 SW 184TH TER	No	No	Yes	Yes	Yes
Old Cutler Retirement Home	21640 OLD CUTLER RD	No	Yes	Yes	Yes	Yes
Paradise Villa	21164 SW 92ND PL	No	Yes	Yes	Yes	Yes
Precious Moments ALF	9480 DANA RD	No	No	Yes	Yes	Yes
Roadesk One Inc.	9700 MONTEGO BAY DR	No	No	Yes	Yes	Yes
The Haven	10601 CARIBBEAN BLVD	No	No	Yes	Yes	Yes
Welcome Home Alf	8950 SW 215TH TER	No	No	Yes	Yes	Yes
Whispering Pines Home Care	8830 SW 196TH DR	No	No	No	Yes	Yes
Miami-Dade County Vehicle Maintenance and Fueling	10740 SW 211TH ST	No	No	Yes	Yes	Yes
Miami-Dade Fire Rescue Station #34	10850 SW 211TH ST	No	No	Yes	Yes	Yes
Miami-Dade Fire Rescue Station #55	21501 SW 87TH AVE	No	Yes	Yes	Yes	Yes
Government Center	10710 SW 211TH ST	No	No	Yes	Yes	Yes
Town Hall	10720 CARIBBEAN BLVD	No	No	Yes	Yes	Yes
A Guardian Group Home	9700 STERLING DR	No	Yes	Yes	Yes	Yes
All Care Residential	18901 SW 97TH AVE	No	Yes	Yes	Yes	Yes
Campos Fleitas	9010 SW 200TH ST	No	No	Yes	Yes	Yes
Cutler Bay Group Home	10471 SW 204TH TER	No	No	Yes	Yes	Yes
Lizi's Garden Group Home	9220 NAUTILUS DR	No	No	Yes	Yes	Yes
Mains'L	19930 HOLIDAY RD	No	No	Yes	Yes	Yes
Sierra Developmental Enterprises	10030 NICARAGUA DR	No	No	Yes	Yes	Yes
Sunrise Opp. Inc	9031 SW 187TH TER	No	No	Yes	Yes	Yes
Sunrise Opp. Inc	9500 SW 191ST TER	No	No	Yes	Yes	Yes
Sunrise Opp. Inc	9765 SW 215TH LN	No	No	No	Yes	Yes
Florida City Gas Sub Station #3	21210 SW 97TH CT	No	Yes	Yes	Yes	Yes
Health South	20601 Old Cutler Road	No	No	No	Yes	Yes
Purdue Medical Center	19590 OLD CUTLER RD	No	No	Yes	Yes	Yes

Facility	Address	CAT 1	CAT 2	CAT 3	CAT 4	CAT 5
South Dade Landfill	23707 SW 97TH AVE	No	Yes	Yes	Yes	Yes
Cutler Bar Police Department	10720 CARIBBEAN BLVD	No	No	Yes	Yes	Yes
Cutler Ridge Police Department	10800 SW 211TH ST	No	No	Yes	Yes	Yes
Bel-Aire Elementary	10205 SW 194TH ST	No	No	Yes	Yes	Yes
Cutler Ridge Elementary	20210 CORAL SEA RD	No	No	Yes	Yes	Yes
Cutler Ridge Middle	19400 GULFSTREAM RD	No	No	Yes	Yes	Yes
Gulfstream Elementary	20900 SW 97TH AVE	No	No	Yes	Yes	Yes
Our Lady of the Holy Rosary	9500 SW 184 St	No	No	No	Yes	Yes
Whigham Elementary	21545 SW 87TH AVE	No	No	Yes	Yes	Yes
Whigham Learning Facility	8035 SW 196TH ST	No	No	Yes	Yes	Yes
Whispering Pines Elementary	18929 SW 89TH RD	No	No	No	Yes	Yes
Station # 0000	20351 OLD CUTLER RD	No	No	No	Yes	Yes
Station # 0507	20299 SW 83RD AVE	No	Yes	Yes	Yes	Yes
Station # 0516	10390 PUERTO RICO DR	No	No	Yes	Yes	Yes
Station # 0517	18445 OLD CUTLER RD	No	No	No	Yes	Yes
Station # 0540	21791 SW 98TH CT	No	Yes	Yes	Yes	Yes
Station # 0577	10010 SW 224TH ST	No	Yes	Yes	Yes	Yes
Station # 0578	SW Corner of Caribbean Blvd and SW 103 Ave	No	Yes	Yes	Yes	Yes
Station # 0583	21600 SW 93RD PATH	No	Yes	Yes	Yes	Yes
Station # 0603	10800 SW 211TH ST	No	Yes	Yes	Yes	Yes
Station # 0609	20000 SW 79TH AVE	No	Yes	Yes	Yes	Yes
Station # 0610	21001 SW 85TH AVE	No	Yes	Yes	Yes	Yes
Station # 0684	20810 OLD CUTLER RD	No	No	Yes	Yes	Yes
Station # 0701	Martinique Drive between Eagle Nest Road and Gulfstream Road	No	No	Yes	Yes	Yes
Station # 0702	8880 SW 220TH ST	No	No	Yes	Yes	Yes
Station # 0703	10869 CARIBBEAN BLVD	No	No	Yes	Yes	Yes
Station # 0704	9290 CUTLER RIDGE DR	No	No	Yes	Yes	Yes
Station # 0705	9500 IRENE DR	No	No	Yes	Yes	Yes
Station # 0706	SW 87th Avenue between Caribbean Blvd and Ridgeland Drive	No	No	Yes	Yes	Yes
Station # 0707	192nd Drive between Caribbean Blvd and Ridgeland Drive	No	No	Yes	Yes	Yes
Station # 0708	10485 SW 202ND TER	No	Yes	Yes	Yes	Yes
Station # 0734	Infront of 9190 SW 203 Terrace (Middle of Cul-de-sac)	No	No	Yes	Yes	Yes
Station # 0744	20504 MANTA DR	No	No	Yes	Yes	Yes
Station # 0750	20400 OLD CUTLER RD	No	No	Yes	Yes	Yes
Station # 1046	8781 SW 216TH ST	No	Yes	Yes	Yes	Yes
Station # 1051	18701 LENAIRE DR	No	Yes	Yes	Yes	Yes
Station # 1052	Belview Drive between Bonito Road and Dolphin Road	No	Yes	Yes	Yes	Yes
Station # 1053	10520 SW 199TH ST	No	Yes	Yes	Yes	Yes

Facility	Address	CAT 1	CAT 2	CAT 3	CAT 4	CAT 5
Station # 1054	SW 97 Avenue Between SW 189 Street and SW 190 Street	No	Yes	Yes	Yes	Yes
Station # 1055	Intersection of SW 98 Avenue and SW 194 Terrace	No	Yes	Yes	Yes	Yes
Station # 1057	Infront of Property 10192 SW 202 Terrace	No	Yes	Yes	Yes	Yes
Station # 1058	On Tiffany Drive between SW 93 Avenue and SW 92 Court	No	Yes	Yes	Yes	Yes
Station # 1059	Infront of Property 9320 Sterling Drive	No	Yes	Yes	Yes	Yes
Station # 1060	10325 MARLIN RD	No	Yes	Yes	Yes	Yes
Station # 1063	SW Corner of Eureka Drive and SW 89 Place	No	No	No	Yes	Yes
Station # 1064	In front of 19531 SW 103 Court	No	Yes	Yes	Yes	Yes
Station # 1067	SW 87 Avenue between SW 184 Terrace and SW 184 Lane	No	No	Yes	Yes	Yes
Station # 1074	19300 SW 82ND AVE	No	No	Yes	Yes	Yes
Station # 1096	21301 SW 87TH AVE	No	Yes	Yes	Yes	Yes
Station # 1109	Across from 8881 SW 212 Terrace	No	Yes	Yes	Yes	Yes
Station # 1111	8981 SW 227TH TER	No	Yes	Yes	Yes	Yes
Station # 1119	Neighboring property- 9131 SW 208 Terrace	No	Yes	Yes	Yes	Yes

Table 3.47 - Summary of Cutler Bay Critical Facilities at Risk to Storm Surge

Facility Type	CAT 1	CAT 2	CAT 3	CAT 4	CAT 5
Assisted Living Centers	0	7	22	25	26
Emergency Response Installation	0	0	1	1	1
Fire Stations	0	1	2	2	2
Government	0	0	2	2	2
Group Homes	0	2	9	10	10
HAZMAT Installation	0	1	1	1	1
Hospitals	0	0	1	2	2
Landfill	0	1	1	1	1
Police Stations	0	0	2	2	2
Schools	0	0	6	8	8
Sewer Pumping Stations	0	24	38	41	41
Total	**0**	**36**	**85**	**95**	**96**

Population at Risk

A hurricane surge analysis was conducted by intersecting the improved parcel layer provided by Miami-Dade County with the polygon shapefile for each hurricane surge layer. In evaluating populations at risk, only those people residing in the hurricane storm surge zones are included. Thus, those improved residential parcels intersecting the hurricane surge zones were counted and multiplied by the Census

Bureau Cutler Bay household factor (3.15). Cutler Bay's population at risk to storm surge is shown in Table 3.48.

Table 3.48 - Cutler Bay Population at Risk to Storm Surge

Hurricane Category	Improved Residential Parcels	Population
Hurricane Category 1	131	413
Hurricane Category 2	8,371	26,369
Hurricane Category 3	12,284	38,695
Hurricane Category 4	12,547	39,523
Hurricane Category 5	12,552	39,539

Source: Miami-Dade County 2013 Tax Assessor's Data, FDEM, U.S. Census Bureau

Life Safety

The very young, the elderly and the handicapped are especially vulnerable to harm from hurricanes. For those who are unable to evacuate for medical reasons, there should be provision to take care of special-needs patients and those in hospitals and nursing homes. Many of these patients are either oxygen-dependent, insulin-dependent, or in need of intensive medical care. There is a need to provide ongoing treatment for these vulnerable citizens, either on the coast or by air evacuation to upland hospitals.

The stress from disasters such as a hurricane can result in immediate and long-term physical and emotional health problems among victims. The Town's Emergency Management Plan and Emergency Management Ordinance help guide evacuation and identification of vulnerable populations.

Evacuation Zones

Figure 3.42 depicts hurricane evacuation zones for Cutler Bay. This figure utilizes a polygon set created by the Miami-Dade County Emergency Management Department based on regional surge zones from a 2007-2010 statewide evacuation study initiated by FDEM.

Because of Cutler Bay's Location in southern Miami-Dade County and adjacent to the Atlantic Ocean, evacuation will be necessary based upon certain tropical storm and or hurricane events. The Florida Department of Emergency Management created the evacuation mapping for Cutler Bay. The eastern and southern portions of the Town are located in Evacuation Zone A. The remainder of the Town is located in Evacuation Zone B.

Residents and visitors are both equally impacted by evacuations in Cutler Bay. Additional public outreach is required to more adequately notify vulnerable populations, residents and visitors in Cutler Bay about evacuation procedures and routes. The primary evacuation routes in Cutler Bay are US 1 and the Florida Turn Pike.

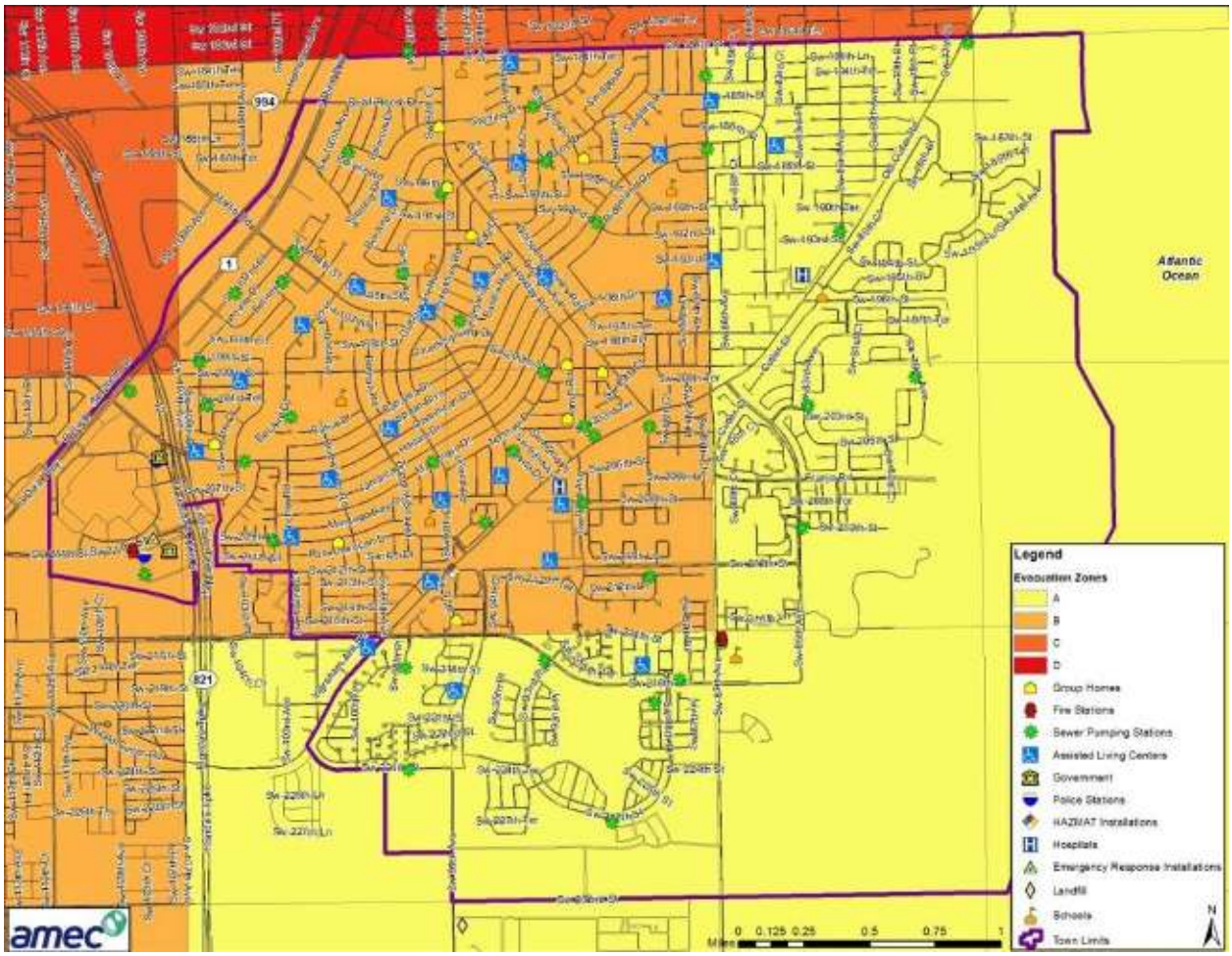
The National Weather Service (NWS) with the Miami-Dade Emergency Management Agency are responsible for notifying residents in Cutler Bay to evacuate. The local news media also provides evacuation guidance to the public.

There are six key components to a successful evacuation:

- Adequate warning
- Adequate routes
- Proper timing to ensure the routes are clear
- Traffic control

- Knowledgeable travelers
- Care for special populations (e.g., the handicapped, prisoners, hospital patients, and schoolchildren)

Those who cannot get out of harm's way need shelter. Typically, the American Red Cross will staff a shelter and ensure that there is adequate food, bedding, and wash facilities. Shelter management is a specialized skill. Managers must deal with problems like scared children, families that want to bring in their pets, and the potential for an overcrowded facility.



Source: Florida Division of Emergency Management (http://www.floridadisaster.org)

Figure 3.42- Cutler Bay Evacuation Zones

3.4 Capability Assessment

Table 3.49 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the Town of Cutler Bay. Excerpts from applicable policies, regulations, and plans and program descriptions follow to provide more detail on existing mitigation capabilities.

Table 3.49- Cutler Bay Regulatory Mitigation Capabilities

Regulatory Tool	Date	Comments
Repetitive Loss Area Analysis	2012	Prepared by Kimley-Horn and Associates, Inc.
Stormwater Master Plan (Basin or sub-basin flood studies)	March 2008	Prepared by Kimley-Horn and Associates, Inc.
Comprehensive Growth Management Plan	April 2008	Prepared by Corradino Group
Capital Improvement Plan	March 2008	Prepared by the Town of Cutler Bay
Land Development Regulations (Zoning and Subdivision Ordinances)	June 2012	Prepared by Corradino Group
Flood Insurance Study	September 2009	Prepared by FEMA
Flood Damage Prevention Ordinance	March 2010	Prepared by the Town of Cutler Bay
Building Code Ordinance	2010	Prepared by the State of Florida
Miami-Dade County Local Mitigation Strategy	May 2010	Prepared by Miami-Dade County Office of Emergency Management
Miami-Dade County Comprehensive Emergency Management Plan	June 2013	Prepared by Miami-Dade County Office of Emergency Management
Southeast Florida Regional Climate Action Plan	October 2012	Prepared by Southeast Florida Regional Climate Change Compact Counties

Repetitive Loss Area Analysis (2012)

The Town is classified as a Repetitive Loss Category "C" community. As a result, the Town developed a Repetitive Loss Area Analysis (RLAA) in 2012 to provide more specific guidance on how to reduce damage from repetitive flooding. The plan follows Section 512.b of the CRS Coordinators manual (DRAFT 4-6-12 Edition: 2012). The RLAA is linked to the Stormwater Master Plan in that it illustrates the RL properties and their relationship to the priority basins identified in the Stormwater Master Plan. RL properties in "priority basins" are considered part of a Repetitive Loss Area (RLA). The "priority basins" became the Capital Improvement Plan for the Town.

The RLAA was used in the development of this FMP to help in identifying repetitive loss properties within the Town and to examine the locations of the RL properties as they relate to FEMA flood zones, flood depths and known localized flooding areas.

Stormwater Master Plan (2008)

The Stormwater Master Plan identifies opportunities to protect surface water quality and reduce flooding within the Town limits. The Stormwater Master Plan includes the following components:

- A review of existing stormwater and drainage data, reports and plans available through SFWMD, Miami-Dade County and Town sources
- A field inventory of existing drainage structures
- A drainage atlas including the type, size and general location of drainage infrastructure elements
- Basin and sub-basin delineations based on available survey data and other sources

- Hydrologic and hydraulic modeling analysis of the existing systems and their capacity to handle the 5-year/24-hour, 10-year/24-hour, 25-year/72-hour, 50-year/72-hour, and 100-year/72-hour storm events
- Identification and analysis of alternatives for improvements needed to alleviate deficiencies identified in the hydrologic and hydraulic modeling phase
- Development of an optional Capital Improvement Plan (CIP) to implement the identified improvements

Based on a review of the drainage deficiencies and input from Town staff, 17 drainage sub-basins were selected as a priority for detailed analysis. The performance goals representing the minimum standards for sub-basin performance are as follows:

- During the five-year return design storm event, flooding in local and collector roadways travel lanes should not exceed the edge of the roadway pavement. This goal is consistent with SFWMD and Miami-Dade County requirements.
- During the 10-year return design storm event, flooding in roadway travel lanes should be below the crown of the roadway. This goal is consistent with Miami-Dade County requirements.
- During the 100-year return design storm event, flooding should be below the building finish floor elevations. This goal is consistent with Miami-Dade County requirements.
- Drainage sub-basins which discharge directly into canals should have water quality pre-treatment for the first one inch of runoff. This standard is consistent with federal, state and county water quality treatment requirements.
- Drainage sub-basins which discharge directly into lakes or drainage wells should have water quality pre-treatment for the first one-half inch of runoff. This standard is consistent with federal, state and county water quality treatment requirements.

Projects were identified to bring each priority sub-basin into compliance with the performance goals, and the 17 priority sub-basins were ranked from worst to best according to current performance against goals. The ranking and budgets for improvements were used to develop a 10-year CIP.

The Stormwater Master Plan was used in the development of this FMP to identify potential flooding sources as well as known localized flooding areas within the Town.

Town of Cutler Bay Comprehensive Growth Management Plan (2008)

A Comprehensive Plan, in broad terms, is a policy statement to guide the future placement and development of community facilities. It is the basis for a community‘s zoning, subdivision and design regulations and a community‘s official maps and amendments to the zoning, subdivision and design ordinances. The Comprehensive Plan identifies a future vision, values, principals and goals for the community, determines the projected growth for the community and identifies policies to plan, direct and accommodate anticipated growth. This document was adopted by the Town in April 2008. Goals from the Cutler Bay Growth Management Plan are as follows:

- Future Land Use Goal
  - Protect and improve the Town’s built and natural environment through the use of land in a manner that enhances existing neighborhoods, conserves resources, ensures the availability of public facilities and services, and realizes the community’s vision for its future.
- Housing Goals
  - Ensure the availability of a decent, safe and sanitary housing stock to accommodate current and future residents.

- Ensure the availability of housing that is affordable to current and future residents of all income and special needs groups in the Town of Cutler Bay.

- Infrastructure Goals
  - Work with the town-wide service provider, Miami-Dade County Water and Sewer Department (WASD), to assure a sufficient, dependable, and high quality potable water supply to meet the needs of Cutler Bay residents and businesses on a timely basis, at a reasonable cost and in compliance with all state and federal requirements to protect the health and safety of the public.
  - The Town will protect the health and safety of the public by ensuring wastewater treatment facilities and services are environmentally sound, cost effective, and meet the community's present and future needs.
  - To protect the health and safety of the public by ensuring stormwater management facilities and services are properly maintained, environmentally sound, cost effective, and meet the community's present and future demands.
  - The Town will promote efficient and economical balance of public and private solid waste collection and disposal services that will meet established requirements in a manner that will protect the public health, safety and environmental resources of the community.
  - The Town will continue to support and monitor county, South Florida Water Management District, state and federal efforts to protect, conserve and manage the quality and quantity of natural groundwater resources.
- Coastal Management Goal
  - Provide for the conservation, environmentally sound use and protection of all natural and historic resources; limit public expenditures in areas subject to destruction by natural disasters; and protect human life and property in the coastal area of the Town.
- Conservation Goal
  - Protect and enhance the long term environmental resources of the Town to ensure continued resource availability and environmental quality through prudent management, public education, appropriate regulations and enforcement, and active partnership with governmental and environmental entities.
- Intergovernmental Coordination Goal
  - Continue to strengthen relationships through intergovernmental coordination with adjacent municipalities, the Miami-Dade County Planners Technical Committee, Miami-Dade County, Miami-Dade County Public School System, regional, state and other governmental entities and service providers that have regulatory, supply and/or jurisdictional authority to identify methods for information sharing and funding, assistance and support in order to protect the health, safety and welfare of the community and to ensure consistency between the local, county, regional and state policies and plans when implementing the Town's Growth Management Plan. The Town will offer to provide guidance and assistance to future municipalities in Miami-Dade County.
- Capital Improvements Goals
  - Identify the public facilities and infrastructure capacity needed, as outlined in the Growth Management Plan, to accommodate existing and future residents and businesses in the Town of Cutler Bay, to provide such facilities and infrastructure in a timely and efficient manner and adopt financial policies in order to guide the funding, scheduling and construction of improvements.
  - Develop and maintain a concurrency management system, including the adopted level of service standards, to track and issue development orders in order to ensure the availability of public facilities and infrastructure needed to support development are available concurrent with the impacts of such development.

- Transportation Goals
    - Provide for the citizens of Cutler Bay, a safe, convenient, accessible and efficient transportation system.
    - The Town shall develop a financially feasible transportation system that meets the needs of the Town residents.
- Recreation & Open Space Goal
    - To provide and ensure a comprehensive system of public parks, open spaces and recreational programs that are well planned, convenient and customized to the recreational needs of the residents of Cutler Bay while preserving and protecting valuable natural resources for future generations.
- Educational Facilities Goal
    - Develop, operate, and maintain a system of public education by Miami-Dade County public schools, in cooperation with the county and other appropriate governmental agencies, which will strive to improve the quality and quantity of public educational facilities available to the citizenry of Miami-Dade County, Florida.

The Comprehensive Growth Management Plan was used in the development of this FMP to identify existing and future land use; growth and development trends; and cultural, historic and natural resources within the Town.

Capital Improvement Plan (2008-2018)

The Town of Cutler Bay Stormwater Master Plan identified 17 priority sub-basins that were ranked from worst to best according to current performance against established Plan goals. The Capital Improvement Program is based on the results of the 17 priority subbasin studies. Recommended improvements to achieve the stated performance goals were identified for each basin, and a ten-year CIP summary including preliminary budgets has been prepared for each basin.

The Capital Improvement Plan was used in the development of this FMP to identify potential flooding sources as well as known localized flooding areas within the Town. The Capital Improvement Plan was also used to develop mitigation strategies and projects.

Land Development Regulations (2012)

The purpose of the Land Development Regulations is to provide the minimum regulations necessary to facilitate safe and orderly growth, and to also ensure that growth forms an integral part of a community of functional neighborhoods, retail and commercial centers; increases collective security and community identity to promote civic awareness and responsibility; and enhances the quality of life for the entire Town to ensure the greatest possible economic and social benefits for all residents. These regulations are intended to promote consistency with the goals, objectives and policies of the Town's Growth Management Plan.

The Land Development Regulations were used in the development of this FMP to identify mitigation strategies through protection of natural floodplain resources, open space preservation and identifying property protection measures.

Flood Insurance Study (2009)

A Flood Insurance Study (FIS) dated September 2009 was prepared by FEMA for Miami-Dade County, Florida and Incorporated Areas which includes the Town of Cutler Bay. The FIS identifies areas within Cutler Bay that are subject to flooding from the 100-year storm event. This information is used by Cutler

Bay to implement floodplain regulations as part of participation in the NFIP and to promote sound land use and floodplain development within the community.

The FIS was used in the development of this FMP to identify FEMA flood hazard areas and to calculate the associated flood depths for the 100-year storm event. The flood depths were then used to prepare the risk assessment for Cutler Bay. Based on the flood depth, a depth damage factor was applied to each parcel based on its occupancy class in order to calculate an accurate damage assessment for each parcel located within the 100-year flood hazard area.

Flood Damage Prevention Ordinance (2010)

The Flood Damage Prevention Ordinance is perhaps the Town's most important flood mitigation tool. The Town first adopted the ordinance in May 2006, and the Town has been a participant in the NFIP since August 2006. The ordinance has been amended a couple of times; the most recent amendment was made in March 2010.

The objectives of this ordinance are to:

1) Protect human life, health and to eliminate or minimize property damage;
2) Minimize expenditure of public money for costly flood control projects;
3) Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
4) Minimize prolonged business interruptions;
5) Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, roadways, and bridges and culverts located in floodplains;
6) Maintain a stable tax base by providing for the sound use and development of flood prone areas in such a manner as to minimize flood blight areas; and
7) Ensure that potential homebuyers are notified that property is in a food hazard area.

The Flood Damage Prevention Ordinance was used in the development of this FMP to assist in the risk assessment and identification of potential mitigations strategies and projects.

Building Code Ordinance (2010)

The Town of Cutler Bay has by ordinance adopted and enforces the 2010 Florida Building Code which includes provisions for all buildings and structures constructed in whole or in part in a flood hazard area to be constructed in accordance with specific elevation requirements. The Building Code also includes provisions for high-velocity hurricane zones to mitigate wind damage from hurricanes and other wind storms.

The Florida Building Code was used in the development of this FMP to assist in the risk assessment and identification of potential mitigations strategies and projects.

Miami-Dade County Local Mitigation Strategy (2010)

The Town of Cutler Bay has by ordinance adopted the 2010 Miami-Dade County Local Mitigation Strategy (LMS). The Town's Stormwater Master Plan identified several flood mitigation projects that were included in the County's 2010 LMS. The LMS also includes other flood mitigation related projects identified by Town staff. Goals from the Miami-Dade County LMS are as follows:

- The primary mitigation goal is to reduce vulnerability to natural, technological and societal hazards from all sources but especially, in South Florida, from hurricanes, tornadoes, major rainfall and other severe weather events.
- Related to the above is the goal to mitigate the extent and severity of the problems created by these hazards and to, collaterally, secure the necessary commitments and, to the maximum extent feasible, the necessary resources to implement mitigation activities in annual action plans to achieve these goals.
- To prevent any additions to the list of "Repetitive Loss Properties" published annually by the FEMA National Flood Insurance Program (NFIP) and to reduce the number of repetitive loss properties to a point where the municipalities and the county can qualify as a category A or B Community (i.e. a community containing no more than nine repetitive loss properties). A repetitive loss property is a single property that has two or more NFIP flood insurance claims of $1,000 or more.
- To assure incremental improvements in municipalities' standing and classification in the Community Rating System (CRS), with the related consequences of making flood insurance under the NFIP more affordable and reachable, while improving cities' effectiveness in coping with flood hazards, problems and emergencies. It is also a goal of the Local Mitigation Strategy to ensure that all the municipalities in Miami-Dade County are or will become members of the CRS program.
- Increase the continual dissemination of information on a repetitive basis with respect to the existence of flood hazards and the availability of measures to mitigate the problems presented by such hazards.
- Continually improve and maintain cutting-edge, state-of-the-art, effectiveness of the cities' emergency preparedness and disaster response capacity.
- To increase the level of coordination of mitigation management concerns, plans and activities at the municipal, county, state and federal levels of government.
- To secure an enforceable commitment for the implementation of the local hazard mitigation strategy.

The Miami-Dade County LMS was used in the development of this FMP to assist in the identification of potential mitigations strategies and projects.

Miami-Dade County Comprehensive Emergency Management Plan (2013)

The Miami-Dade County Comprehensive Emergency Management Plan (CEMP) is designed to address "all hazards" threats to the County. In the event of a countywide emergency declaration, the corporate resources of the County and each of its municipalities work together for the mutual benefit of all residents and visitors of Miami-Dade County. Goals from Miami-Dade County CEMP are as follows:

- To provide an organized system of hazard vulnerability reduction to the citizens of and visitors to Miami-Dade County.
- To develop an enhanced level of awareness relative to emergency preparedness, throughout the population at large.
- To provide the most efficient response and recovery system possible through effective coordination and maximum utilization of all available resources.
- To coordinate the return of essential services to a normal state as quickly and effectively as possible after a disaster.
- To maintain a high level of readiness through community outreach and regular training.
- To reduce the public's vulnerability to recurrent hazards by the promotion of hazard mitigation strategies, particularly in the areas of critical infrastructure, land use, and building codes.

The Miami-Dade County CEMP was used in the development of this FMP to assist in the identification of potential mitigations strategies and projects.

Southeast Florida Regional Climate Action Plan (2012)

The objective of the Southeast Florida Regional Climate Action Plan is to integrate climate adaptation and mitigation into existing decision-making systems through actions that can be implemented through existing local and regional agencies, processes and organizations. Goals from the Southeast Florida Regional Climate Action Plan are as follows:

- Reduce financial and physical losses in our building stock by reshaping where and how we build.
- Reduce greenhouse gas emissions by planning, designing, and prioritizing walkable, affordable communities supported by sustainable multimodal transportation options.
- Advance water management strategies and infrastructure improvements needed to mitigate for adverse impacts of climate change and sea level rise on water supplies, water and wastewater infrastructure, and water management systems.
- Implement monitoring, management, and conservation programs designed to protect natural systems and improve their capacity for climate adaptation.
- Ensure the continued viability of agriculture in Southeast Florida through policies which remove barriers to production, promote economic incentives, improve water reliability, and provide research on best management practices, thereby encouraging sustainable production in the face of a changing climate.
- Increase renewable energy capacity and reduce consumption of electricity and fuel.
- Provide a more resilient natural and built physical environment in light of climate change.
- Communicate the risks related to climate change and the value of adapting policies and practices to achieve resilience throughout the region.
- Guide and influence local, regional, state and federal climate change related policies and programs through collaboration and joint advocacy.

The Southeast Florida Regional Climate Action Plan was used in the development of this FMP to assist in the risk assessment for sea level rise and identification of potential mitigations strategies and projects.

3.4.1 Administrative/Technical Mitigation Capabilities

Table 3.50 identifies Town personnel responsible for activities related to mitigation and loss prevention in the Town of Cutler Bay.

Table 3.50 - Cutler Bay Administrative/Technical Capabilities

Resource	Y/N	Responsible Department	Comments
Planner/Engineer with knowledge of land development/land management practices	Y	Community Development Dept	CFM
Engineer/Professional trained in construction practices related to buildings and/or infrastructure	Y	Public Works Dept	CFM's
Planner/Engineer/Scientist with an understanding of natural hazards	Y	Community Development & Public Works Dept	
Personnel skilled in GIS	Y	Community Development Dept	Utilize consultants
Full time building official	Y	Community Development Dept	
Floodplain Manager	Y	Office of the Town Manager, Community Development & Public	CFM's

Resource	Y/N	Responsible Department	Comments
		Works Dept	
Emergency Manager	Y	Public Works Dept	Aided by Miami-Dade County
Grant writer	Y	Office of the Town Manager	
GIS data – hazard areas	N		Miami-Dade County
GIS data – critical facilities	Y	Community Development Dept	
GIS data – building footprints	N		Miami-Dade County
GIS data – land use	Y	Community Development Dept	
GIS data – links to assessor's data	N		Miami-Dade County
Warning systems/services	N		Miami-Dade County

3.4.2 Fiscal Mitigation Capabilities

Table 3.51 identifies financial tools or resources that the Town could potentially use to help fund mitigation activities.

Table 3.51 - Cutler Bay Fiscal Mitigation Capabilities

Resource	Accessible? Y/N	Comments
Community development block grants	Y	
Capital improvements project funding	Y	Ongoing Capital Improvement Plan
Authority to levy taxes for specific purposes	Y	
Fees for water, sewer, gas or electric services	Y	
Impact fees for new development	Y	
Incur debt through general obligation bonds	Y	
Incur debt through special tax bonds	Y	
Incur debt through private activities	N	
Withhold spending in hazard prone areas	Y	

3.4.3 Mitigation Outreach and Partnerships

Mitigation Outreach

Annual Mailing of Hazard Information

Annually, the Town of Cutler Bay mails a brochure concerning flood-related subjects to every address in the Town. Subjects discussed in the brochure include flood safety, flood warning, flood hazard areas, drainage system maintenance/stream ordinance, property protection measures, flood protection assistance, floodplain development regulations, substantial improvement/ damage requirements, the National Flood Insurance Program, natural and beneficial functions of wetlands, and flood-zone descriptions.

Since hurricanes and tropical storms are a major flood producer for the community, also included in the annual mailing is a Hurricane Evacuation Zone Map and a Hurricane Tracking Map with instructions concerning hurricane safety. The instructions provide information about sheltering, family disaster planning, flood hazards in Cutler Bay due to hurricane storm surge, and evacuation as well as definitions of terms used by weather forecasters.

Public Library
In addition to the direct distribution of educational brochures, hurricane tracking maps, and other information by the Town, the public library also houses and distributes a variety of emergency and disaster-related documents and brochures.

The Town has engaged in the following flood mitigation outreach activities as detailed in Table 3.52.

Table 3.52 - Flood Mitigation Outreach Activities

Project/Event	Message	Frequency
Project Kick-off – Public Meeting	Presentation, Informational Brochures and Flyers	One-time
Flood Mitigation Meeting	Presentation, Informational Brochures and Flyers	One-time
Miami Herald	Article and FMPC meeting announcement	One-time
South Dade News Leader	Article on 1st FMPC Public Meeting	One-time
Cutler Bay News	FMPC Meeting Announcement	One-time
Movie Night	Public Service Announcement	One-time
Caribbean Blvd Holiday – Work Zone Open	Presentation, Informational Brochures and Flyers	One-time
Chili Cook-Off	Surveys and Information Materials	One-time
Roadway Resurfacing Phase III + Flood Flyers	Presentation, Informational Brochures and Flyers	One-time
Tree Trimming & Canopy Uplifting Project – Bel Aire Section 9 & 10	Informational Brochures and Flyers	One-time
Tree Trimming & Canopy Uplifting Project – Bel Aire Section 1	Informational Brochures and Flyers	One-time
Councilmember Loyzelle's Newsletter	FMPC Meeting Announcement	One-time
Concerned Citizen's Meeting (2/4/14)	Presentation, Informational Brochures and Flyers	One-time
Sidewalk Repairs	Presentation, Informational Brochures and Flyers	One-time
Alina-School	Presentation, Informational Brochures and Flyers	One-time
Taste of the Bay	Surveys and Informational Materials	One-time
Old Cutler Glenn HOA Meeting	Presentation, Informational Brochures and Flyers	One-time
Movie Night at the Park	PSA, Informational Materials and Surveys	One-time
Relay for Life	Charity Event, Outreach	One-time
Marlin MOT	Informational Brochures and Flyers	One-time
Concerned Citizens Meeting (3/4/14)	Presentation, Surveys and Informational Materials	One-time
OCR Grand Re-Opening	Presentation, Surveys and Informational Materials	One-time
Make Mitigation Happen – Repetitive Loss Properties	Surveys and Informational Materials	One-time
CBBA Luncheon	Informational Materials and Surveys	One-time
CBBA Meeting	Presentation, Surveys and Informational Materials	One-time
Seagrape HOA Meeting	Information Materials	One-time
Concerned Citizens Meeting (4/1/14)	Presentation, Informational Brochures and Flyers	One-time
Flood Surveys for Repetitive Loss Properties	Informational Brochures and Flyers	One-time
Enclave Fair at Enclave Club House	Informational Materials and Surveys	One-time
Centennial (Chanterelle) HOA Meeting	Information Materials	One-time
CBBA/EDC Luncheon	Informational Materials and Surveys	One-time
Cutler Bay Press Release	Announcing April 2014 Committee and Public Meeting	One-time
MOT Work Zone 2 Detour	Informational Brochure and Flyers	One-time
South Dade News Leader	Meeting Announcement	One-time
Miami Herald Neighbors Section	Meeting Announcement	One-time
Flood Mitigation Meeting	Presentation, Surveys and Informational Materials	One-time
Cutler Bay Website	Survey	Continuous/4

Project/Event	Message	Frequency
		months
Councilmember Mixon	FMPC Meeting Announcement at Council Meetings	Monthly
Cutler Bay Website	FMPC Meeting Announcement	Monthly
Cutler Bay Announcement Board	FMPC Meeting Announcement	Monthly

Partnerships

Local

The Town is a partner with Miami-Dade County Office of Emergency Management and South Florida Water Management District. The Town is an active participant in Miami-Dade County's Local Mitigation Strategy which includes flood mitigation projects for the Town. The Town also utilizes Miami-Dade County's Hurricane Preparedness and Emergency Evacuation Programs and provides links to this information on the Town's website. Furthermore, the Town uses flood mitigation publications prepared by Miami-Dade County and the South Florida Water Management District.

State

The Town is a partner with the State of Florida Department of Emergency Management. The Town utilizes the State's hurricane surge maps and hurricane evacuation zones to perform local risk assessments and to develop mitigation strategies. The Town also partners with the State on grant funding opportunities.

Federal

The Town is a partner with FEMA. The Town utilizes FEMA's flood insurance study to perform local risk assessments and to enforce local floodplain management ordinances. The Town also utilizes FEMA literature and brochures to promote flood risk awareness.

4 MITIGATION STRATEGY

Requirement §201.6(c)(3): [The plan shall include] a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section describes the mitigation strategy process and mitigation action plan for the Cutler Bay Floodplain Mitigation Plan. It describes how the Town met the following requirements from the 10-step planning process:

- Planning Step 6: Set Goals
- Planning Step 7: Review Possible Activities
- Planning Step 8: Draft an Action Plan

4.1 Mitigation Strategy: Overview

The results of the planning process, the risk assessment, the goal setting, and the identification of mitigation actions led to the mitigation strategy and mitigation action plan for this FMP. Section 4.2 below identifies the goals and objectives of this plan and Section 4.4 details the new mitigation action plan. The following umbrella mitigation strategy was developed for this FMP:

Communicate the hazard information collected and analyzed through this planning process as well as FMPC success stories so that the community better understands what can happen where and what they themselves can do to be better prepared.

Implement the action plan recommendations of this plan.

Use existing rules, regulations, policies, and procedures already in existence.

Monitor multi-objective management opportunities so that funding opportunities may be shared and packaged and broader constituent support may be garnered.

4.1.1 Continued Compliance with NFIP

Given the flood hazards in the planning area, an emphasis will be placed on continued compliance with the NFIP and participation in the Community Rating System. Detailed below is a description of the Town of Cutler Bay's flood management program to ensure continued compliance with the NFIP.

Cutler Bay's Flood Management Program

Cutler Bay joined the NFIP in August of 2006. Since then, the Town has administered floodplain management regulations that meet and exceed the minimum requirements of the NFIP. Under that arrangement, residents and businesses paid the same flood insurance premium rates as most other communities in the country.

The Community Rating System (CRS) was created in 1990. It is designed to recognize floodplain management activities that are above and beyond the NFIP's minimum requirements. Cutler Bay is

currently a Class 6 community, which gives a 20% premium discount to individuals in Cutler Bay in the Special Flood Hazard Area, and a 10% discount to policyholders outside the Special Flood Hazard Area.

The activities credited by the CRS provide direct benefits to Cutler Bay and its residents, including:

- Enhanced public safety;
- A reduction in damage to property and public infrastructure;
- Avoidance of economic disruption and losses;
- Reduction of human suffering; and
- Protection of the environment.

The following is a summary of Cutler Bay's total CRS credit points by activity:

Activity 310 – Elevation Certificates: The Building Department maintains elevation certificates for new and substantially improved buildings. Copies of elevation certificates are made available upon request. Elevation certificates, plans, regulations and other records are maintained in a secure location away from the permit office. (66 credit points received)

Activity 320 – Map Information: Credit is provided for furnishing inquirers with flood zone information from the community's latest FIRM, publicizing the service annually and maintaining records. (140 credit points received)

Activity 330 – Outreach Projects: A community brochure is mailed to all properties in the community on an annual basis. An outreach brochure is mailed annually to all properties in the SFHA. Cutler Bay also provides flood information in the permit office and Town Hall, distributes both a County and Town hurricane guide, and prints flood information in the phonebook. (218 credit points received)

Activity 340 – Hazard Disclosure: Credit is provided for the local real estate agents disclosure of flood hazards to prospective buyers. (10 credit points received)

Activity 350 – Flood Protection Information: Documents relating to floodplain management are available in the reference section of the Miami Dade Library. Credit is also provided for floodplain information displayed on the community's website. (48 credit points received)

Activity 360 Flood Protection Assistance: Cutler Bay provides technical advice and assistance to interested property owners and annually publicizes the service. (62 credit points received)

Activity 410 – Additional Flood Data: Credit is provided for a cooperating technical partnership agreement with FEMA. (11 credit points received)

Activity 420 – Open Space Preservation: Credit is provided for preserving approximately 1,904 acres in the SFHA as open space. Credit is also provided for open space land that is deed restricted and preserved in a natural state. (401 credit points received)

Activity 430 – Higher Regulatory Standards: Credit is provided for enforcing regulations that require freeboard for new and substantial improvement construction, cumulative substantial improvement, lower substantial improvement, other higher regulatory standards, and state mandated regulatory standards. Credit is also provided for a BCEGS classification of 4/4 and for staff education and certification as a floodplain manager. (338 credit points received)

Activity 440 – Flood Data Maintenance: Credit is provided for maintaining and using digitized maps, overlay maps and parcel records in the day to day management of the floodplain. Credit is also provided for establishing and maintaining a system of benchmarks. (107 credit points received)

Activity 450 – Stormwater Management: Cutler Bay enforces regulations for stormwater management, freeboard in non-SFHA zones, soil and erosion control, and water quality. (125 credit points received)

Section 510 – Floodplain Management Planning: Cutler Bay has 32 unmitigated repetitive loss properties and is a Category C community for CRS purposes. All requirements for a Category C community have been met. Credit is provided for the adoption and implementation of a Floodplain Mitigation Plan. A progress report must be submitted on an annual basis. (102 credit points received)

Activity 540 – Drainage System Maintenance: Portions of Cutler Bay's drainage system are inspected regularly throughout the year and maintenance is performed as needed by the Town of Cutler Bay Public Works Department. Records are being maintained for both inspections and required maintenance. Credit is also provided for an ongoing Capital Improvements Program. The Town also enforces a regulation prohibiting dumping in the drainage system. (240 credit points received)

Activity 610 Flood Warning Program: Credit is provided for program that provides timely identification of impending flood threats, disseminates warnings to appropriate floodplain residents, and coordinates flood response activities. (85 credit points received)

Activity 630 – Dam Safety: All CRS communities in Florida currently receive credit for the State's Dam Safety Program. (71 credit points received)

4.2 Goals and Objectives

Requirement §201.6(c)(3)(i): [The mitigation strategy section shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Section 3.0 documents the flood hazards and associated risks that threaten the Town of Cutler Bay including the vulnerability to structures, infrastructure, and critical facilities. Section 3.0 also evaluates the capacity of the Town to reduce the impact of those hazards. The intent of Goal Setting is to identify areas where improvements to existing capabilities (policies and programs) can be made so that community vulnerability is reduced. Goals are also necessary to guide the review of possible mitigation measures. This Plan needs to make sure that recommended actions are consistent with what is appropriate for Cutler Bay. Mitigation goals need to reflect community priorities and should be consistent with other plans in the Town and within Miami-Dade County.

Goals: are general guidelines that explain what is to be achieved. They are usually broad-based policy type statements, long term and represent Global visions. Goals help define the benefits that the plan is trying to achieve.

Objectives: are short term aims, when combined, form a strategy or course of action to meet a goal. Unlike goals, objectives are specific and measurable.

4.2.1 Coordination with Other Planning Efforts

The goals of this plan need to be consistent with and complement the goals of other planning efforts. The primary planning document where the goals of this Plan must complement and be consistent with is the Miami-Dade Local Mitigation Strategy and to a lesser degree the community's comprehensive plan. The importance of Cutler Bay's comprehensive plan is that this plan is developed and designed to guide the future growth within the Town. Therefore, there should be some consistency in the overall goals and how they relate to each other. Likewise, the goals of the county's local mitigation strategy play an important role as Cutler Bay participates in this multi-jurisdictional plan and each plan focuses on the flood hazards.

4.2.2 Goal Setting Exercise

On July 17th, 2011, the Cutler Bay Floodplain Mitigation Planning Committee (FMPC) conducted an exercise to outline its goals for this flood mitigation plan. The first part of the exercise including asking each committee member: *"What would you like to see in Cutler Bay's future?"* Each member was given a handout which appears in Figure 4.1.

Committee members wrote down their choices on post-it-notes. Each member then explained their choices to the larger committee membership. The notes were posted on the wall and then organized by similar topics. There was some consistency in the members' topics. The handout has 22 possible statements, but the members' nominations included fewer than half of them. The results are listed below:

- Confine new development to areas already developed
- Special attention to older established business areas (eliminate blight)
- Less traffic congestion (improved roads and new bike lanes)
- Improved recreational facilities (preserve historical and cultural sites)
- Improved housing and improving the business climate
- Increase knowledge of local residents (special attention to the elderly and disabled)

A second exercise was then conducted to recommend mitigation goals. Each member was given the hand out that appears in Figure 4.2 which asks *"What should be the goals of the mitigation program?"* Committee members wrote down their top three choices on post-it-notes. Each member explained their choices to the larger membership. After the notes were placed on the wall, they were then organized by similar topics. The resulting goals are listed below:

- Protect homes and businesses
- Make sure future development doesn't make things worse
- New Development should occur in areas already developed
- Maximize the use of state and federal funds to protect property
- Protect the lives, health, safety and welfare of the citizens of Cutler Bay
- Protect critical and public infrastructure

The goal statements selected by committee members were in line with what they wanted to see in Cutler Bay's future. The exercise revealed important information to guide the planning effort. For example, members stressed the importance of protecting lives and property, even though improving the economy and increasing the number of jobs was an important part of their vision for the future.

4.2.3 Resulting Goals

At the end of the exercises, the FMPC agreed upon four general goals for this planning effort. The goals were refined and include:

Goal 1: Protect the health, safety and welfare of the citizens of Cutler Bay from the effects of flooding

Goal 2: Promote a public education program to encourage residents to undertake mitigation measures that reduce the effects of flood damage on private property

Goal 3: Protect critical and essential facilities from flood damage

Goal 4: Reduce the number of repetitively flooded structures

4.2.4 Resulting Objectives

The FMPC also included objectives in support of the goals. The FMPC developed ten objectives in for implementing each goal. The objective numbers relate to the goal numbers above. The objectives include:

Objective 1.1: Reduce flood damage to insurable buildings and public infrastructure through stormwater improvement projects

Objective 1.2: Preserve open space areas, especially where there are sensitive natural areas

Objective 1.3: Promote higher development and design standards to protect new buildings from flood damage

Objective 2.1: Encourage residents to assume an appropriate level of responsibility for their own flood protection

Objective 2.2: Promote flood insurance as a property protection measure against potential flood damage

Objective 2.3: Develop a public education program for the local schools

Objective 3.1: Seek county, state and federal support for mitigation projects

Objective 3.2: Prioritize critical and essential facilities in need of protection from potential flood damage

Objective 4.1: Leverage local, state and federal grant funding to facilitate mitigation actions such as elevation, acquisition, or floodproofing

Objective 4.2: Target repetitive loss properties for implementation of mitigation projects

Goals Exercise 1

What would you most like to see in Cutler Bay's future?

Here are possible answers to this question, listed in alphabetical order. Pick three that you think are most important. You may reword them or add new ones if you want.

You have three cards. Use one card for each of your top three answers.

- Educated children
- Improved air quality
- Improved water quality
- Less new development
- Less traffic congestion
- Improved/more businesses
- Improved/more cultural facilities
- Improved/more housing
- Improved/more public transportation
- Improved/more job opportunities
- Improved/more knowledgeable residents
- Improved/more open space
- Improved/more shopping
- New development confined to areas already developed
- Preserved historical/cultural sites
- Special attention given to elderly/disabled
- Special attention given to lower income areas
- Special attention given to newer shopping areas
- Special attention given to older business areas
- Younger people staying/moving into the area
- Other_____

Figure 4.1 - Handout for Goal Outline Exercise

Goals Exercise 2

What should be the goals of our mitigation program?

Here are possible answers to this question, listed in alphabetical order. Pick three that you think are most important. You may reword them or add new ones if you want.

You have three cards. Use one card for each of your top three answers.

- Help people protect themselves
- Make sure future development doesn't make things worse
- Maximize the share paid by benefiting property owners
- Maximize use of state and federal funds
- Minimize property owner's expenditures
- Minimize public expenditures
- New developments should pay the full cost of protection measures
- Protect businesses from damage
- Protect cars and other vehicles
- Protect centers of employment
- Protect critical facilities
- Protect forests
- Protect homes
- Protect new/future buildings
- Protect people's lives
- Protect power stations and power lines
- Protect public health
- Protect public services (fire, police, etc.)
- Protect repetitively flooded areas
- Protect scenic areas, greenways, etc.
- Protect schools
- Protect shopping areas
- Protect streets
- Protect utilities (power, phone, water, sewer, etc.)
- Protect wetlands/environmentally sensitive areas
- Protect a particular area_____
- Protect a particular property_____
- Restrict development in hazardous areas
- Use public/private partnerships
- Other_____

Figure 4.2 - Handout for Goal Setting Exercise

4.3 Identification and Analysis of Mitigation Activities

Requirement §201.6(c)(3)(ii): [The mitigation strategy section shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

In order to identify and select mitigation projects to support the mitigation goals, each hazard identified in Section 3.1 Hazard Identification was evaluated. Because of the Town's proximity to the Atlantic Ocean, high water table, and poor drainage, each flood-related hazard was considered to be a priority hazard. The following were determined to be priority flood-related hazards:

- Climate Change and Sea Level Rise
- Coastal/Canal Bank Erosion
- Flood: 100/500 year
- Flood: Stormwater/ Localized Flooding
- Hurricane and Tropical Storms (including Storm Surge)

Once it was determined which flood hazards warranted the development of specific mitigation actions, the FMPC analyzed viable mitigation options that supported the identified goals and objectives. The FMPC was provided with the following list of mitigation categories which are utilized as part of the CRS planning process.

- Prevention (Required to be evaluated)
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information and Outreach

The FMPC was also provided with examples of potential mitigation actions for each of the above categories. The FMPC was instructed to consider both future and existing buildings in evaluating possible mitigation actions. A facilitated discussion then took place to examine and analyze the options. Appendix B, Mitigation Strategy, provides a detailed discussion organized by CRS mitigation category of possible mitigation alternatives for the Town to assist in the review and identification of possible mitigation activities. This comprehensive review of possible mitigation activities details why some were appropriate for implementation and why others were not. As promoted by CRS, Prevention type mitigation alternatives were discussed for the flood hazards. This discussion was followed by a brainstorming session that generated a list of preferred mitigation actions by hazard.

4.3.1 Prioritization Process

Once the mitigation actions were identified, the FMPC was provided with several decision- making tools, including FEMA's recommended prioritization criteria, STAPLEE sustainable disaster recovery criteria; Smart Growth principles; and others, to assist in deciding why one recommended action might be more important, more effective, or more likely to be implemented than another. STAPLEE stands for the following:

- Social: Does the measure treat people fairly? (e.g. different groups, different generations)
- Technical: Is the action technically feasibly? Does it solve the problem?
- Administrative: Are there adequate staffing, funding and other capabilities to implement the project?
- Political: Who are the stakeholders? Will there be adequate political and public support for the project?
- Legal: Does the jurisdiction have the legal authority to implement the action? Is it legal?
- Economic: Is the action cost-beneficial? Is there funding available? Will the action contribute to the local economy?
- Environmental: Does the action comply with environmental regulations? Will there be negative environmental consequences from the action?

In accordance with the DMA requirements, an emphasis was placed on the importance of a benefit-cost analysis in determining action priority. It was agreed that the following four criteria would be used to determine the priority of the action items:

- Contribution of the action to save life or property
- Availability of funding and perceived cost-effectiveness
- Available resources for implementation
- Ability of the action to address the problem

A comprehensive review of mitigation measures was performed using the criteria (alternatives and selection criteria) in Appendix B.

With these criteria in mind, FMPC members were asked to prioritize the importance of each mitigation project based on whether the project should be a low, medium or high priority. The FMPC reached consensus on the priority for each mitigation project.

The process of identification and analysis of mitigation alternatives allowed the FMPC to come to consensus and to prioritize recommended mitigation actions. During the process, emphasis was placed on the importance of a benefit-cost review in determining project priority; however, this was not a quantitative analysis. The team agreed that prioritizing the actions collectively enabled the actions to be ranked in order of relative importance and helped steer the development of additional actions that meet the more important objectives while eliminating some of the actions which did not garner much support. Benefit-cost was also considered in greater detail in the development of the Mitigation Action Plan detailed below in Section 4.4. The cost-effectiveness of any mitigation alternative will be considered in greater detail through performing benefit-cost project analyses when seeking FEMA mitigation grant funding for eligible actions associated with this plan.

The FMPC determined that cost benefit review of each of the mitigation actions was clearly an important criterion in the prioritization process. They discussed the contribution of the action to saving lives or property as first and foremost, with additional consideration given to the benefit-cost aspect of a project.

4.4 Mitigation Action Plan

Requirement §201.6(c)(3)(iii): [The mitigation strategy section shall include an] action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

This action plan was developed to present the recommendations developed by the FMPC for how the Town of Cutler Bay can reduce the risk and vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses. Emphasis was placed on both future and existing development. The action plan summarizes who is responsible for implementing each of the prioritized actions as well as when and how the actions will be implemented. Each action summary also includes a discussion of the benefit-cost review conducted to meet the regulatory requirements of the Disaster Mitigation Act. Table 4.1 identifies the mitigation actions.

It is important to note that the Town of Cutler Bay has many existing, detailed action descriptions, which include benefit-cost estimates, in other planning documents, such as, stormwater plans, and capital improvement budgets and reports. These actions are considered to be part of this plan, and the details, to avoid duplication, should be referenced in their original source document. The FMPC also realizes that new needs and priorities may arise as a result of a disaster or other circumstances and reserves the right to support new actions, as necessary, as long as they conform to the overall goals of this plan.

Further, it should be clarified that the actions included in this mitigation strategy are subject to further review and refinement; alternatives analyses; and reprioritization due to funding availability and/or other criteria. The Town is not obligated by this document to implement any or all of these projects. Rather this mitigation strategy represents the desires of the community to mitigate the risks and vulnerabilities from identified hazards. The actual selection, prioritization, and implementation of these actions will also be further evaluated in accordance with the CRS mitigation categories and criteria contained in Appendix B.

Table 4.1 - Summary of Cutler Bay Mitigation Actions

Action	Related to Goal	Address Current Development	Address Future Development	Continued Compliance with NFIP	Mitigation Category
Identify segments of canals where erosion is causing banks to collapse and prepare a prioritized list for improvements	1 & 4	Y	Y	N	Property Protection and Natural Resource Protection
Cleanout all storm drains on a bi-annual basis	1, 3 & 4	Y	Y	Y	Preventative and Property Protection
Improve drainage along the C-100 canal through a dredging project	1, 3 & 4	Y	Y	Y	Preventative, Property Protection and Structural Projects
Improve drainage in the Saga Bay sub basin through upgraded stormwater piping	1 & 4	Y	Y	Y	Preventative, Property Protection, and Structural Projects
Implement program to identify all catch basins located on private streets in gated communities	1 & 4	Y	N	N	Preventative
Continue implementation of drainage system maintenance on all surface water channels, canals and ditches	1, 3 & 4	Y	Y	Y	Preventative and Property Protection
Improve drainage along SW 212th Street with construction of a new outfall	1, 3 & 4	Y	Y	Y	Preventative, Property Protection, and Structural Projects
Promote an Enviro Scape model to elementary school students	2	N	N	N	Public Information and Outreach
Work with local, state and federal partners to target repetitive loss properties for acquisition or elevation	2 & 4	Y	N	Y	Property Protection
Promote retrofitting techniques for floodproofing of residential structures	2 & 4	Y	N	Y	Property Protection
Revise local codes to require landscapers to obtain licenses	1 & 2	Y	Y	N	Preventative and Public Information and Outreach
Work with the Miami-Dade Association of Realtors to require flood zones to be included in a	1 & 2	Y	Y	N	Public Information and Outreach

Action	Related to Goal	Address Current Development	Address Future Development	Continued Compliance with NFIP	Mitigation Category
MLS					
Promote the purchase of flood insurance to residents and businesses	1, 2 & 3	Y	Y	Y	Property Protection and Public Information and Outreach
Protect the natural floodplain functions within the Town including the Cutler Wetlands	1, 2, 4	Y	Y	Y	Natural Resource Protection
Increase awareness of the flood hazard through development of a Program for Public Information PPI	1 and 2	Y	N	Y	Public Information and Outreach
Work with Miami-Dade County Emergency Management on identifying vulnerable populations for evacuations	1 and 2	Y	N	N	Emergency Services and Public Information and Outreach
Work with Miami-Dade County Emergency Management, state and federal governments, to protect vulnerable critical facilities	1 and 3	Y	N	N	Emergency Services

4.5 Flood-Hazard Mitigation Actions

1. Identify segments of canals where erosion is causing banks to collapse and prepare a prioritized list for improvements

Project Description: Inventory all canals (whether owned by the town or other agency or community) to determine where erosion is causing banks to erode and collapse so that a capital improvement strategy can be put in place for maintenance.

Hazards Addressed: Flood – Canal Bank Erosion

Issue/Background: Canals throughout the Town's jurisdiction are in need of maintenance so that nearby properties are not adversely affected by erosion and potential collapse of canal banks.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital Improvement Program

Responsible Office: Department of Public Works

Priority (H, M, L): High

Cost Estimate: Unknown

Benefits (Losses Avoided): Reduces potential losses to buildings which could be damaged from canals not operating properly.

Potential Funding: Town of Cutler Bay Capital Improvement Funds

Timeframe: 2016

2. Cleanout all storm drains on a bi-annual basis

Project Description: Ensure that storm drains are cleaned on a regular and consistent basis in order to maintain adequate stormwater drainage as they were designed.

Hazards Addressed: Flood - Stormwater/ Localized Flooding

Issue/Background: Storm drains throughout the Town's jurisdiction are in need of regular cleaning/maintenance so that nearby properties are not adversely affected by inadequate drainage and ponding of stormwater.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital Improvement Program and Town's Operating Budget

Responsible Office: Department of Public Works

Priority (H, M, L): High

Cost Estimate: $225,000

Benefits (Losses Avoided): Reduces potential losses to buildings which could be damaged from catch basins not draining properly.

Potential Funding: Town of Cutler Bay Capital Improvement Funds and Town's Operating Budget

Timeframe: Complete every 2 years

3. Improve drainage along the C-100 canal through a dredging project

Project Description: Mitigate/reduce flooding in the sub-basin that currently outfalls to the canal by dredging the C-100 canal.

Hazards Addressed: Flood – Stormwater/ Localized Flooding

Issue/Background: The C-100 canal is in need of dredging in order to improve drainage in the adjacent sub-basin.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital Improvement Program and funding support from Miami-Dade County

Responsible Office: Department of Public Works

Priority (H, M, L): High

Cost Estimate: Unknown

Benefits (Losses Avoided): Reduces potential losses to buildings which could be damaged from inadequate drainage within the canal.

Potential Funding: Town of Cutler Bay Capital Improvement Funds with support from Miami-Dade County

Timeframe: 2016

4. Improve drainage in the Saga Bay sub-basins through upgraded stormwater piping

Project Description: Based on hydrologic and hydraulic calculations, the capacity of the existing drainage infrastructure is not sufficient to discharge the volume of runoff that is necessary to meet the desired performance criteria for the modeled storm events.

Hazards Addressed: Flood – Stormwater/ Localized Flooding

Issue/Background: Observed flooding across roadway and localized ponding in roadway in multiple locations within the sub-basins. Multiple complaints have been received.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital Improvement Program

Responsible Office: Department of Public Works

Priority (H, M, L): High

Cost Estimate: Detailed phasing cost estimates are included in the Cutler Bay Stormwater Master Plan.

Benefits (Losses Avoided): Reduces potential losses to buildings which could be damaged from stormwater ponding. This project will help to eliminate hazardous driving conditions for the citizens of Cutler Bay during heavy rainfall events.

Potential Funding: Town of Cutler Bay Capital Improvement Funds

Timeframe: Phased implementation through 2019

5. Implement program to identify all catch basins located on private streets in gated communities

Project Description: Inventory all catch basins located on private streets in gated communities in order to develop a plan for maintenance.

Hazards Addressed: Flood – Stormwater/ Localized Flooding

Issue/Background: Property owners in gated communities are located on private streets where the Town has no responsibility to clean catch basins. The Town gets numerous complaints concerning the lack of maintenance. The Town does not have a comprehensive inventory of all catch basins on private streets. Since storm drains must be cleaned on a regular basis in order to ensure adequate drainage, an inventory will help to assess the severity of the problem.

Other Alternatives: Leave maintenance up to homeowners.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The public works department's maintenance procedures

Responsible Office: Department of Public Works

Priority (H, M, L): Medium

Cost Estimate: $20,000

Benefits (Losses Avoided): Reduces potential losses to buildings on private streets which could be damaged from catch basins not draining properly.

Potential Funding: Town of Cutler Bay Operating Budget

Timeframe: 2018

6. Continue implementation of drainage system maintenance on all surface water channels, canals and ditches

Project Description: Maintain all surface water channels, canals and ditches in order to ensure the proper storage, disposal and water quality treatment of runoff.

Hazards Addressed: Flood – Stormwater/ Localized Flooding

Issue/Background: Drainage features throughout the Town's jurisdiction are in need of regular maintenance so that nearby properties are not adversely affected by reduced function.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital Improvement Program

Responsible Office: Department of Public Works

Priority (H, M, L): High

Cost Estimate: Unknown

Benefits (Losses Avoided): Reduces potential losses to buildings which could be damaged from channel, canals and ditches not operating properly.

Potential Funding: Town of Cutler Bay Capital Improvement Funds

Timeframe: Annually

7. Improve drainage along SW 212th Street with construction of a new outfall

Project Description: Upgrade the stormwater infrastructure along SW 212th street in order to ensure sufficient discharge of stormwater runoff.

Hazards Addressed: Flood – Stormwater/ Localized Flooding

Issue/Background: Observed flooding across roadway and localized ponding in roadway.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital Improvement Program

Responsible Office: Department of Public Works

Priority (H, M, L): Medium

Cost Estimate: $425,000

Benefits (Losses Avoided): Reduces potential losses to buildings which could be damaged from stormwater ponding and prevents hazardous driving conditions for residents.

Potential Funding: Town of Cutler Bay Capital Improvement Funds

Timeframe: 2017

8. Promote an Enviro-Scape model to elementary school students

Project Description: Help elementary school students to better understand the sources of flooding and prevention of water pollution.

Hazards Addressed: Flood – Stormwater/ Localized Flooding

Issue/Background: The Town is committed to public outreach programs dedicated to informing the public about flood risk and pollution prevention.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Community's Outreach Program

Responsible Office: Town Manager and Public Works

Priority (H, M, L): Low

Cost Estimate: $2,000

Benefits (Losses Avoided): Educates children on how to avoid flood damage and the benefits of reduced stormwater pollution.

Potential Funding: Town's Operating Budget

Timeframe: Annually

9. Work with local, state and federal partners to target repetitive loss properties for acquisition or elevation

Project Description: Target repetitive loss properties for either acquisition or retrofitting to eliminate the potential for future flooding.

Hazards Addressed: Flood – 100/500 yr and Stormwater/ Localized Flooding

Issue/Background: The Town has a number of repetitive loss buildings including some which are located in X - Zones. To eliminate the potential for future flood damage, the Town would like to work with other local, state and federal partners to prepare a strategy for mitigation of these buildings.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Flood Damage Prevention Ordinance (NFIP), along with federal grant programs.

Responsible Office: Department of Community Development

Priority (H, M, L): Medium

Cost Estimate: Unknown

Benefits (Losses Avoided): Reduces potential losses to buildings which could be damaged from future flood events.

Potential Funding: Local, State and Federal Grant Funding

Timeframe: 2019

10. Promote retrofitting techniques for floodproofing of residential structures

Project Description: Promote public outreach efforts where residents can help themselves to potentially eliminate damage from low level flooding to their structure by encouraging retrofitting techniques.

Hazards Addressed: All Flooding Types

Issue/Background: There are simple things residents and business can do to help reduced damage from the food hazard. Applying a moisture barrier with adhesive along the bottom few feet of a residence along with barriers for openings in doors can help eliminate flood damage to slab on grade homes.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Flood Damage Prevention Ordinance

Responsible Office: Department of Public Works and Planning and Zoning

Priority (H, M, L): Low

Cost Estimate: $5,000

Benefits (Losses Avoided): Reduces potential losses to buildings which could be damaged from all types of flooding

Potential Funding: Town of Cutler Bay Operating Budget

Timeframe: 2019

11. Develop local ordinance to require landscapers to register with the Town

Project Description: The Town wants to make sure area landscape businesses don't create flooding conditions by blowing grass and leaves toward or into catch basins. The Town wants to license Landscape business to ensure when working in the Town they are fully aware of the requirement not to put debris into catch basins.

Hazards Addressed: Flood – Local Stormwater

Issue/Background: One of the major causes of local stormwater flooding is due to homeowners and landscape professionals blowing yard waste into catch basins as opposed to bagging and removing the yard waste from site. By issuing licenses to landscape businesses, the Town is more likely to know who is doing work in the Town. Additionally, the fees generated can increase the public outreach efforts.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Town Codes/Ordinance

Responsible Office: Department of Public Works

Priority (H, M, L): High

Cost Estimate: Unknown

Benefits (Losses Avoided): Reduces potential losses to buildings which could be damaged from local stormwater flooding.

Potential Funding: Town of Cutler Bay Operating Budget

Timeframe: 2016

12. Work with Miami-Dade County Association of Realtors to require flood zones to be included in a LMS

Project Description: Work with the Miami-Dade County Association of Realtors to provide flood zone information in the Multiple Listing Service (MLS) to better inform residents as to whether a property is located in a flood zone.

Hazards Addressed: All Types of Flooding

Issue/Background: Most potential purchasers of homes or businesses don't know if that building is located in a flood prone area or a designated floodplain. Having the MLS disclose this information would greatly increase the buyer's knowledge of flood risk and the potential hazard.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Miami-Dade Multiple Listing Service

Responsible Office: Department of Community Development in cooperation with local Cutler Bay Real Estate Agents

Priority (H, M, L): Medium

Cost Estimate: Staff Time

Benefits (Losses Avoided): N/A Upfront knowledge of the risk to the property

Potential Funding: Town of Cutler Bay's Operating Budget

Timeframe: 2018

13. Promote the purchase of flood insurance to residents and businesses

Project Description: Increase the Town's flood insurance policy base to ensure that residents are adequately protected from flood damage. The Town's outreach program can increase the messaging in a number of ways to encourage the purchase of flood insurance including working with local insurance agents.

Hazards Addressed: All Flooding Types

Issue/Background: Since a majority of the Town is located in a 100-year floodplain, the more buildings that have flood insurance the fewer properties that will not have to dig into their own pockets to repair their home or business.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Cutler Bay's Outreach Program

Responsible Office: Department of Community Development and Public Works

Priority (H, M, L): Low

Cost Estimate: $10,000

Benefits (Losses Avoided): N/A Public outreach and awareness that flood insurance is a homeowner's

first line of defense against flood damage.

Potential Funding: Town of Cutler Bay's Operating Budget

Timeframe: 2017

14. Protect the natural floodplain functions within the Town including the Cutler Wetlands

Project Description: Preserve the Cutler Wetlands as a natural area on the east side of Cutler Bay to protect homes against storm surge and sea-level rise. Additionally, the wetland areas serve as a natural habitat for certain species of plant and animals which should also be protected.

Hazards Addressed: Storm Surge and Sea-Level Rise

Issue/Background: The Cutler Wetlands is natural barrier to storm surge and sea-level rise from the Atlantic Ocean. Natural buffers are necessary to protect buildings from flood damage whether they are dunes or natural wetland protection areas. The Town of Cutler Bay is fortunate to have this large wetland area in the east part of the Town. Protecting this area from infiltration of development should be a strategy.

Other Alternatives: Allowing development to encroach upon this natural buffer.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Town of Cutler Bay's Comprehensive Plan and Zoning Ordinance

Responsible Office: Department of Community Development/Building and Zoning

Priority (H, M, L): Medium

Cost Estimate: Local Staff Time

Benefits (Losses Avoided): Reduces potential losses to buildings which could be damaged from storm surge and sea-level rise.

Potential Funding: Town of Cutler Bay's Operating Budget

Timeframe: 2019

15. Increase awareness of the flood hazard through development of a Program for Public Information

Project Description: Increase outreach efforts by determining which types of messages, target audiences and target areas should be focused upon in an overall outreach strategy to better inform the public of flood risks and flood response efforts.

Hazards Addressed: All Types of Flooding

Issue/Background: Improving upon the overall messaging, the dissemination methods, and who the

Town is targeting with those messages will improve the overall effectiveness of the outreach program and may result in a better informed public.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Town's Outreach Program

Responsible Office: Department of Public Works

Priority (H, M, L): High

Cost Estimate: Staff Time

Benefits (Losses Avoided): N/A Better informed public can result in better protection to buildings

Potential Funding: Town of Cutler Bay's Operating Budget

Timeframe: 2015

16. Work with Miami-Dade County Emergency Management on identifying vulnerable populations for evacuations

Project Description: Inventory and identify vulnerable populations within the Town to ensure that the elderly and those who are disabled are recognized by first responders and their locations are established so that the emergency management officials understand where these populations reside in case evacuations become necessary.

Hazards Addressed: All Flooding Types

Issue/Background: In many cases emergency managers are not aware of where vulnerable populations are located. Having this information in a data base and in GIS mapping can better equip responders with the knowledge to assist in evacuations.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Miami-Dade County Emergency Management

Responsible Office: Town Manager and Police Department

Priority (H, M, L): High

Cost Estimate: Unknown

Benefits (Losses Avoided): N/A

Potential Funding: State Emergency Management Grant Funding

Timeframe: 2017

17. Work with Miami-Dade County Emergency Management and state and federal governments to protect vulnerable critical facilities

Project Description: Protecting critical facilities from flood damage is necessary to ensure they operate properly during flooding conditions.

Hazards Addressed: All Flood Types

Issue/Background: Critical facilities which operate as either evacuation centers or pump flood waters, or sewage should be protected from flood damage so they perform without interruption.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Miami-Dade County Local Mitigation Strategy

Responsible Office: Police Department and Town Manager

Priority (H, M, L): Medium

Cost Estimate: Unknown

Benefits (Losses Avoided): Reduces potential damage to critical facilities.

Potential Funding: HMGP Grant Funding and State Emergency Management Funding

Timeframe: 2019

5 PLAN ADOPTION

Requirement §201.6(c)(5): [The plan shall include] documentation that the plan has been formally approved by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council).

The purpose of formally adopting this plan is to secure buy-in from the Town of Cutler Bay, raise awareness of the plan, and formalize the plan's implementation. The adoption of this plan completes Planning Step 9 of the 10-step planning process: Adopt the Plan, in accordance with the requirements of DMA 2000. The Town Council has adopted the Floodplain Mitigation Plan by passing a resolution. A copy of the executed resolution is shown below.

RESOLUTION NO. 15-27

A RESOLUTION OF THE MAYOR AND TOWN COUNCIL OF THE TOWN OF CUTLER BAY, FLORIDA, RELATING TO THE ADOPTION OF THE REVISED FLOODPLAIN MITIGATION PLAN; PROVIDING FOR IMPLEMENTATION; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, on May 2, 2012, the Town of Cutler Bay (the "Town") was one of two (2) local governments in the State of Florida selected by the Federal Emergency Management Agency (FEMA) to receive grant funding ($50,000) to assist in the development of the Town's Floodplain Mitigation Plan; and

WHEREAS, the Town has been an active participant in the Flood Mitigation Assistance (FMA) planning process in concert with FEMA's Disaster Mitigation Act (DMA) of 2000 Planning Requirements and FEMA's National Flood Insurance Program's (NFIP) CRS Program Activity 510 Planning requirements with full and open public meetings; and

WHEREAS, the appointed Floodplain Mitigation Planning Committee (FMPC) worked with Town Staff and the Council Liaison under the mission, goals and objects set forth for the Floodplain Mitigation Plan; and

WHEREAS, the FMA Program requires that a community officially adopt a Floodplain Mitigation Plan; and

WHEREAS, on October 15, 2014, the Town Council adopted the Floodplain Mitigation Plan via Resolution No. 14-73; and

WHEREAS, recently the adopted Flood Mitigation Plan was submitted to FEMA for its compliance with the Federal Hazard Mitigation Planning Standards contained in 44 CFR 201.6(b)-(d) and after further review, FEMA requested several changes; and

WHEREAS, the Town Council finds that the adoption of the revised Floodplain Mitigation Plan is in the best interest of the health, safety and welfare of the residents of the Town.

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF CUTLER BAY, FLORIDA, THAT:

Section 1. Recitals. The above recitals are true and correct and are incorporated herein by this reference.

Section 2. Adoption and Implementation of Revised Floodplain Mitigation Plan. That the revised Floodplain Mitigation Plan in substantially the form attached as Exhibit "A" is hereby adopted.

Section 3. **Implementation.** The Town Manager is authorized to take all actions necessary to implement the revised Plan and pursue available funding opportunities for implementation of the mitigation projects contained in the revised Floodplain Mitigation Plan.

Section 4. **Effective Date.** This Resolution shall take effect immediately upon adoption.

PASSED and ADOPTED this 20th day of May, 2015.

ERNEST N. SOCHIN
Vice Mayor

Attest:

JACQUELINE N. WILSON
Interim Town Clerk

TOWN OF CUTLER BAY INCORPORATED 2005 FLORIDA

APPROVED AS TO FORM AND
LEGAL SUFFICIENCY FOR THE
SOLE USE OF THE TOWN OF CUTLER BAY:

WEISS SEROTA HELFMAN
COLE & BIERMAN, P.L.
Town Attorney

Moved By: Council Member Mixon
Seconded By: Council Member Coriat

FINAL VOTE AT ADOPTION:

Mayor Peggy R. Bell	YES
Vice Mayor Ernest N. Sochin	YES
Council Member Roger Coriat	YES
Council Member Sue Ellen Loyzelle	YES
Council Member Mary Ann Mixon	YES

STATE OF FLORIDA
COUNTY OF MIAMI-DADE

I, Jacqueline N. Wilson, Interim Town Clerk of the Town of Cutler Bay, Florida, hereby certify that the attached is a true and correct copy of Resolution 15-27 as shown in the records of the Town on file in the office of the Town Clerk.

Witness my hand and corporate seal of the Town of Cutler Bay, FL, this 29th day of May, 2015.

Jacqueline N. Wilson, Interim Town Clerk

6 PLAN IMPLEMENTATION AND MAINTENANCE

Requirement §201.6(c)(4): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning. This is Planning Step 10 of the 10-step planning process. This section provides an overview of the overall strategy for plan implementation and maintenance and outlines the method and schedule for monitoring, updating, and evaluating the plan. The section also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

6.1 Implementation

Once adopted, the plan must be implemented in order to be effective. While this plan contains many worthwhile actions, the Town of Cutler Bay will need to decide which action(s) to undertake first. The priority assigned the actions in the planning process and funding availability will affect that decision. Low or no-cost actions most easily demonstrate progress toward successful plan implementation.

An important implementation mechanism that is highly effective and low-cost is incorporation of the hazard mitigation plan recommendations and their underlying principles into other plans and mechanisms, such as the Town's Comprehensive Growth Management Plan and Stormwater Management Plan. The Town of Cutler Bay already implements policies and programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms.

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government. Implementation will be accomplished by adhering to the schedules identified for each action and through constant, pervasive, and energetic efforts to network and highlight the multi-objective, win-win benefits to each program and the Cutler Bay community. This effort is achieved through the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable community. Additional mitigation strategies could include consistent and ongoing enforcement of existing policies and vigilant review of programs for coordination and multi-objective opportunities.

Simultaneous to these efforts, it is important to maintain a constant monitoring of funding opportunities that can be leveraged to implement some of the more costly recommended actions. This will include creating and maintaining a bank of ideas on how to meet local match or participation requirements. When funding does become available, the Town will be in a position to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, state and federal earmarked funds, benefit assessments, and other grant programs, including those that can serve or support multi-objective applications.

Responsibility for Implementation of Goals and Activities

The elected officials and officials appointed to head each department within the Town are charged with implementation of various activities in the plan. During the quarterly reviews as described later in this section, an assessment of progress on each of the goals and activities in the plan will be determined and noted. At that time, recommendations will be made to modify timeframes for completion of activities, funding resources, and responsible entities. On a quarterly basis, the priority standing of various activities

may also be changed. Some activities that are found not to be doable may be deleted from the plan entirely and activities addressing problems unforeseen during plan development may be added.

6.1.1 Role of Hazard Mitigation Planning Committee in Implementation, Monitoring and Maintenance

With adoption of this plan, the Town of Cutler Bay will be responsible for the plan implementation and maintenance. The FMPC identified in Section 2 will reconvene quarterly each year to ensure mitigation strategies are being implemented and the Town continues to maintain compliance with the NFIP. As such, Cutler Bay agrees to continue its relationship with the FMPC and:

- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high-priority, low/no-cost recommended actions;
- Ensure hazard mitigation remains a consideration for community decision makers;
- Maintain a vigilant monitoring of multi-objective cost-share opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;
- Report on plan progress and recommended revisions to the Town Council; and
- Inform and solicit input from the public.

The primary duty is to see the plan successfully carried out and report to the Town Council, FDEM, FEMA, and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, considering stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information on the Town's website (and others as appropriate).

6.2 Maintenance

Plan maintenance implies an ongoing effort to monitor and evaluate plan implementation and to update the plan as progress, roadblocks, or changing circumstances are recognized.

6.2.1 Maintenance Schedule

The Town of Cutler Bay's Building & Code Compliance Division Manager is responsible for initiating plan reviews. In order to monitor progress and update the mitigation strategies identified in the action plan, Cutler Bay will revisit this plan quarterly and following a hazard event. The Town will submit a five-year written update to FDEM and FEMA Region IV, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule. With this plan update anticipated to be fully approved and adopted in 2014, the next plan update for the Town will occur in 2019.

6.2.2 Maintenance Evaluation Process

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the plan. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions;
- Increased vulnerability as a result of failed or ineffective mitigation actions; and/or
- Increased vulnerability as a result of new development (and/or further annexation).

Updates to this plan will:

- Consider changes in vulnerability due to action implementation;
- Document success stories where mitigation efforts have proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Incorporate new data or studies on hazards and risks;
- Incorporate new capabilities or changes in capabilities;
- Incorporate growth and development-related changes to infrastructure inventories; and
- Incorporate new action recommendations or changes in action prioritization.

Changes will be made to the plan during the update process to accommodate for actions that have failed or are not considered feasible after a review of their consistency with established criteria, time frame, community priorities, and/or funding resources. Actions that were not ranked high but were identified as potential mitigation activities will be reviewed as well during the monitoring and update of this plan to determine feasibility of future implementation. Updating of the plan will be by written changes and submissions, as is appropriate and necessary, and as approved by the Town Council. In keeping with the five-year update process, the FMPC will convene public meetings to solicit public input on the plan and its routine maintenance and the final product will be adopted by the Town Council.

Specifically, the Town will adhere to the following process for the next update of this FMP:

Quarterly Plan Review Process

For the 2015 flood mitigation plan update review process, the Town's Building & Code Compliance Division Manager, on behalf of the Town Council, will be responsible for facilitating, coordinating, and scheduling reviews and maintenance of the plan. The review of the Floodplain Mitigation Plan will normally occur on a quarterly basis each year and will be conducted as follows:

- The Town's Building & Code Compliance Division Manager will place an advertisement in the local newspaper advising the public of the date, time, and place for each quarterly review of the plan and will be responsible for leading the meeting to review the plan.
- Notices will be mailed to the members of the FMPC, federal, state, and local agencies, non-profit groups, local planning agencies, representatives of business interests, neighboring communities, and others advising them of the date, time, and place for the review.
- Town officials will be noticed by email and telephone or personal visit and urged to participate.
- Members of the Town's Planning Commission and other appointed commissions and groups will also be noticed by email and either by telephone or personal visit.
- Prior to the review, department heads and others tasked with implementation of the various activities will be queried concerning progress on each activity in their area of responsibility and asked to present a report at the review meeting.
- The local news media will be contacted and a copy of the current plan will be available for public comment.
- After the review meeting, minutes of the meeting and a quarterly report will be prepared by the FMPC and forwarded to the news media (public) and the ISO/CRS specialist for the CRS program. The report will also be presented to the Town Council for review, and a request will be made that the Council take action to recognize and adopt any changes resulting from the review.

Criteria for Quarterly Reviews

The criteria recommended in 44 CFR 201 and 206 will be utilized in reviewing and updating the plan. More specifically, the quarterly reviews will include the following information:

- Community growth or change in the past quarter.
- The number of substantially damaged or substantially improved structures by flood zone
- The renovations to public infrastructure including water, sewer, drainage, roads, bridges, gas lines, and buildings.
- Natural hazard occurrences that required activation of the Emergency Operations Center (EOC) and whether or not the event resulted in a presidential disaster declaration.
- Natural hazard occurrences that were not of a magnitude to warrant activation of the EOC or a federal disaster declaration but were severe enough to cause damage in the community or closure of businesses, schools, or public services.
- The dates of hazard events descriptions.
- Documented damages due to the event.
- Closures of places of employment or schools and the number of days closed.
- Road or bridge closures due to the hazard and the length of time closed.
- Assessment of the number of private and public buildings damaged and whether the damage was minor, substantial, major, or if buildings were destroyed. The assessment will include residences, mobile homes, commercial structures, industrial structures, and public buildings, such as schools and public safety buildings.
- Review of any changes in federal, state, and local policies to determine the impact of these policies on the community and how and if the policy changes can or should be incorporated into the Floodplain Mitigation Plan. Review of the status of implementation of projects (mitigation strategies) including projects completed will be noted. Projects behind schedule will include a reason for delay of implementation.

6.2.3 Incorporation into Existing Planning Mechanisms

Another important implementation mechanism that is highly effective and low-cost is incorporation of the Floodplain Mitigation Plan recommendations and their underlying principles into other Town plans and mechanisms. Where possible, plan participants will use existing plans and/or programs to implement hazard mitigation actions. As previously stated, mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. As described in this plan's capability assessment, the Town of Cutler Bay already implements policies and programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms. These existing mechanisms include:

- Town Comprehensive Growth Management Plan
- Town Emergency Operations Plans
- Town ordinances
- Flood/stormwater management/master plans
- Other plans, regulations, and practices with a mitigation focus

Those involved in these other planning mechanisms will be responsible for integrating the findings and recommendations of this plan with these other plans, programs, etc, as appropriate. As described in Section 6.1 Implementation, incorporation into existing planning mechanisms will be done through the routine actions of:

- Monitoring other planning/program agendas;
- Attending other planning/program meetings;

- Participating in other planning processes; and
- Monitoring community budget meetings for other community program opportunities.

The successful implementation of this mitigation strategy will require constant and vigilant review of existing plans and programs for coordination and multi-objective opportunities that promote a safe, sustainable community.

Efforts should continuously be made to monitor the progress of mitigation actions implemented through other planning mechanisms and, where appropriate, their priority actions should be incorporated into updates of this hazard mitigation plan.

6.2.4 Continued Public Involvement

Continued public involvement is imperative to the overall success of the plan's implementation. The update process provides an opportunity to solicit participation from new and existing stakeholders and to publicize success stories from the plan implementation and seek additional public comment. The plan maintenance and update process will include continued public and stakeholder involvement and input through attendance at designated committee meetings, web postings, press releases to local media, and through public hearings.

Public Involvement Process for Quarterly Reviews

The public will be noticed by placing an advertisement in the newspaper specifying the date and time for the review and inviting public participation. The FMPC, local, state, and regional agencies will be notified and invited to attend and participate.

Public Involvement for Five-year Update

When the FMPC reconvenes for the update, they will coordinate with all stakeholders participating in the planning process—including those that joined the committee since the planning process began—to update and revise the plan. In reconvening, the FMPC plans to identify a public outreach subcommittee, which will be responsible for coordinating the activities necessary to involve the greater public. The subcommittee will develop a plan for public involvement and will be responsible for disseminating information through a variety of media channels detailing the plan update process. As part of this effort, public meetings will be held and public comments will be solicited on the plan update draft. The subcommittee will also coordinate this public outreach process with the public information program established pursuant to the 2013 guidelines from the Community Rating System (CRS).

Appendix A

Appendix A: Planning Process

Planning Step 1: Organize to Prepare the Plan

RESOLUTION 13-56

A RESOLUTION OF THE MAYOR AND TOWN COUNCIL OF THE TOWN OF CUTLER BAY, FLORIDA AUTHORIZING THE ESTABLISHMENT OF A FLOODPLAIN MITIGATION PLAN ADVISORY COMMITTEE FOR THE PURPOSE OF DEVELOPING A PLAN TO MINIMIZE THE TOWN VULNERABILITY TO FLOODING, WHILE PROTECTING THE NATURAL AND BENEFICIAL FUNCTIONS OF THE FLOODPLAIN; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, on May 25, 2006, the Town of Cutler Bay (the "Town") Town Council adopted the Town Floodplain Management Regulations via Ordinance No. 06-10 as a formal requirement for participation in the National Flood Insurance Program (NFIP); and

WHEREAS, the purpose of the Floodplain Management Regulations is to promote the public health, safety and welfare of Town residents while minimizing public and private losses due to flood conditions; and

WHEREAS, management of the Town's floodplain is an important means of protecting the natural and beneficial functions of the floodplain; and

WHEREAS, the participation of the Town in the NFIP's Community Rating System requires the Town to have a Floodplain Management Plan that meets the minimum standards outlined in 44 CFR 78.5, 78.6, 201.6 and comply with the Local Multi-Hazard Mitigation Plan; and

WHEREAS, in 2012, the State of Florida Division of Emergency Management (DEM) awarded a grant in the amount of $50,000 (12FM-23-11-23-02) to the Town as part of the Flood Mitigation Assistance Grant Program to prepare the Town Mitigation Plan; and

WHEREAS, it is in the best interest of the Town to incorporate in the development of the Flood Mitigation Plan a public participation component and development of a comprehensive community-based plan; and

WHEREAS, the Town Council finds that this Resolution will promote the health, safety and welfare of the residents of the Town.

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND TOWN COUNCIL OF THE TOWN OF CUTLER BAY, FLORIDA, AS FOLLOWS:

Section 1. **Recitals.** The above recitals are true and correct and are incorporated herein by this reference.

Section 2. **Flood Mitigation Plan.** The purpose of the Flood Mitigation Plan is to identify activities that will reduce future flood losses, improve local hazard mitigation capability, increase public and private sector awareness and address and protect cultural, economic, and natural resources.

Section 3. **Creation of the Flood Mitigation Plan Advisory Committee.** The Town Council hereby creates a citizens committee, to be known as the "Flood Mitigation Plan Advisory Committee" to assist the Town in the development of the Flood Mitigation Plan. The Committee activities will include, but is not limited to, technical and non-technical input related to floodplain management, review of documents, participation in community outreach initiatives, and assist in the preparation of the Flood Mitigation Plan. Councilmember Mixon is hereby appointed Council liaison to the Committee and shall report to the Town Council as to the Committee's activities on a regular basis.

Section 4. **Composition of the Committee.** The formation of the Flood Mitigation Plan Committee is hereby authorized as follows:

Voting Members	
Local Residents	(two (2) member –reside in the Special Flood Hazardous Area (SFHA)
Local Business	(one (1) member –business active in the community)
Insurance Agent	(one (1) member – services the NFIP insurance)
Real Estate Agent	(one (1) member –lists sells homes in the SFHA)

Non-Voting Technical Experts to Committee	
Non-Governmental Organization (NGO)	(one (1) member – South Florida Chapter of the American Red Cross or other compatible local NGO)
Government Agency	(one (1) member – South Florida Water Management District "SFWMD" or Miami-Dade County)
Town Staff	(two (2) members – Department of Community Development and Public Works Department)

Voting members of the Committee must be local residents.

Section 5. **Continuation of Committee.** The Flood Mitigation Plan Advisory Committee (or similar) will continue to meet as needed to monitor the implementation of the Flood Mitigation Plan.

Section 6. **Town Committee Ordinance.** This Committee shall be subject to Town Ordinance 10-08, as amended by Ordinance 11-08.

Section 7. **Effective Date.** This resolution shall take effect immediately upon adoption.

PASSED and ADOPTED this 17th day of July, 2013.

Edward P. MacDougall, Mayor

Attest:

Debra E. Eastman, MMC
Town Clerk

TOWN OF CUTLER BAY INCORPORATED 2005 FLORIDA

APPROVED AS TO FORM AND
LEGAL SUFFICIENCY FOR THE
SOLE USE OF THE TOWN OF CUTLER BAY:

WEISS SEROTA HELFMAN PASTORIZA
COLE & BONISKE, P.L.
Town Attorney

Moved By: Council Member Mixon

Seconded By: Council Member Bell

FINAL VOTE AT ADOPTION:

Mayor Edward P. MacDougall	Yes
Vice Mayor Ernest N. Sochin	Yes
Councilmember Peggy R. Bell	Yes
Councilmember Mary Ann Mixon	Yes
Councilmember Sue Ellen Loyzelle	Yes

Exhibit "A"

Town of Cutler Bay
Floodplain Mitigation Plan
Advisory Committee Appointments

Appointee Name	Address
Jorge E. Acevedo, P.E.	7417 SW 189th Street Cutler Bay, FL 33157
Luis A. Badillo	9042 Tiffany Drive Cutler Bay, FL 33157
Paul J. Mauriello, AICP	9230 Sterling Drive Cutler Bay, FL 33157
Janice C. Rowton	19410 Christmas Road Cutler Bay, FL 33157
Dan Vesce	Cutler Bay, FL

Town of Cutler Bay

Floodplain Mitigation Plan
Technical Advisory Committee

Mission Statement:

The mission of the Flood Mitigation Plan Technical Advisory Committee is to guide and assist the community in the development of the Town's "Floodplain Mitigation Plan."

Goals:

Goal 1: To recommend policies to reduce flood losses, improve local hazard mitigation capability, increase public and private sector awareness, and protection of the natural and cultural environment of the Town and maintenance and upgrade of existing infrastructure.

Goal 2: To develop a "Floodplain Mitigation Plan" that provides functional policies and tools to establish realistic and cost-effective measures for the community to mitigate flooding problems within a reasonable timeframe, and consistent with the Town's floodplain ordinances.

Goal 3: Development of technical and non-technical guidelines through a multi-objective management planning process for the implementation and oversight of the "Floodplain Mitigation Plan."

Goal 4: To fully integrate the public into the planning process as required by the Flood Mitigation Assistance (FMA) and Community Rating System (CRS) programs through direct participation in development of the flood mitigation plan and attending a variety of open public meetings and forums.

Objectives:

Objective 1: To attend meetings and be active participants in public meetings.

Objective 2: To promote the "public's" interest in the outcome of the planning process.

Objective 3: To review documentation including minutes of meetings, etc. and make comments in a timely fashion.

Objective 4: To help develop a list of potential mitigation projects that best address Cutler Bay's vulnerability to the flood hazard(s).

Objective 5: To make decisions on the planning process throughout the development of the flood mitigation plan.

Objective 6: To respond to requests for data to supplement the development of the flood mitigation plan.

Objective 7: To review and provide comments on the draft flood mitigation plan

Objective 8: To coordinate, and participate in the public input process.

Objective 9: To inform the public, local officials, outside agencies and other interested parties about the planning process.

Objective 10: To coordinate the formal adoption of the plan by the governing body of the Town.

Program Activities:

- Ensure that a comprehensive review of possible activities and mitigation measures is conducted so that the most appropriate solutions are used to address the hazard.
- Ensure that the recommended activities meet the goals and objectives of the community, do not create conflicts with other activities, and are coordinated to reduce the costs of implementing individual activities.
- Educate residents about hazards, loss reduction measures, and the natural and beneficial functions of floodplains.
- Build public and political support for projects that prevent new problems, reduce losses, and protect the natural and beneficial functions of floodplains.
- Build a constituency that wants to see the plan's recommendation implemented.

Table A-1: FMPC Meeting Dates

Note: All FMPC Meetings were open to the public.

Meeting Type	Meeting Topic	Meeting Date	Meeting Location
FMPC #1 (Kick-off)	1) Introduction to DMA, CRS and the planning process 2) Organize resources: the role of the FMPC, planning for public involvement, and coordinating with other agencies and stakeholders 3) Introduction to hazard identification	October 24, 2013	Town Council Chambers
FMPC #2	1) Program overview/history of project 2) Discussion of Florida Sunshine Law 3) Discussion of the FMPC 's functions and responsibilities 4) Development of flood mitigation plan (four phases of DMA) 5) Overview of Program for Public Information (PPI) 6) Project schedule	December 11, 2013	Town Center Community Room
FMPC #3	1) Local flooding concerns 2) Flood protection and flood safety publications and outreach materials 3) Coordination with other plans, ordinances and studies 4) Public information needs 5) Coordination letter for other agencies and stakeholders and the distribution list for letter	January 16, 2014	Town Center Community Room
FMPC #4	1) Review of public survey results 2) Documentation of coordination with other agencies 3) Identification of local flooding areas 4) Additional assessment of public information needs 5) Target audiences and stakeholders for PPI	February 20, 2014	Town Center Community Room
FMPC #5	1) Discussion of Flood Risk Assessment (Assess the Hazard) 2) Discussion of Vulnerability Assessment (Assess the Problem) 3) Preliminary results from the PPI	April 22, 2014	Town Center Community Room
FMPC #6	1) Development of Goals for FMP 2) Development of Mitigation Strategies for FMP	July 17, 2014	Town Center Community Room
FMPC #7	1) Review "Draft" Floodplain Mitigation Plan 2) Solicit comments and feedback from the FMPC	September 25, 2014	Town Council Chambers

Table A-2: FMPC Invitation List

No.	Name	Title/Organization
1.	Joy Duperault, CFM	NFIP Program Manager - Florida Division of Emergency Management
2.	Miles Anderson	State Hazard Mitigation Officer & NFIP Coordinator
3.	Danny Hinson, CFM, FPEM, CHS-III	Florida Community Rating System Coordinator
4.	Sherry Harper, AICP, CFM	Planning Technical Coordinator ISO Community Hazard Mitigation
5.	Heidi, Liles, CFM	ISO/CRS Specialist
6.	Susan Wilson, CFM	Floodplain Management and Insurance Branch Chief - FEMA Region IV
7.	Janice Mitchell	CRS Coordinator - FEMA Region IV
7.	Jason Hunter	NFIP - FEMA Region IV
8.	Yocelyn Galiano Gomez	Village Manager - Village of Pinecrest
9.	The Honorable Jeff Porter	Mayor of Homestead
10.	Patrick Salerno	City Manager - City of Coral Gables
11.	Ron E. Lewis	Village Manager - Village of Palmetto Bay
12.	Lee Hefty	Miami-Dade Regulatory and Economic Development Agency Environmental Resources Management Department
13.	Jack Osterholt	Director - Miami-Dade County Regulatory and Economic Resources Department
14.	Armando Vilboy	Intergovernmental & Outreach Representative - South Florida Water Management District
15.	Sandy Batchelor	Governing Board Member, SFWMD
16.	Juan M. Portuondo	Governing Board Member, SFWMD
17.	Timothy Sargent	AT Large Appointee Governing Board, SFWMD
18.	Kevin Powers	Vice Chair & At Large Appointee Governing Board, SFWMD
19.	Carlos Castillo	South Florida Region of the American Red Cross
20.	Rusty Pfost	Meteorologist in Charge, National Weather Service Miami Field Office
21.	Cathie Perkins	LMS Coordinator-Planner Miami-Dade Emergency Management
22.	To Whom It May Concern	US Army Corp of Engineers - Miami Resident Office
23.	Alberto M. Carvalho	Superintendent - Miami-Dade Public Schools
24.	The Honorable Carlos A. Gimenez	Mayor of Miami-Dade
25.	Matt Johnson	Public Information Officer - Key Biscayne National Park
26.	To Whom It May Concern	Fortis College - Cutler Bay Campus
27.	To Whom It May Concern	CBT - College - Cutler Bay Campus
28.	Paul Souza	US Fish and Wildlife Service - SE Florida Ecological Field Office
29.	Tyree Davis	Information Resource Management Director - NOAA SE Fisheries Science Ctr
30.	Susan Mason	Program Manager - FL DEP - Southeast District
31.	Alina Hudak	Interim Director, Public Works and Waste Management
32.	Mr. Gus Pego	Florida Department of Transportation District 6 Office
33.	James F. Murley	Executive Director - South Florida Regional Planning Council

FMPC Meeting Advertisements in Local Newspapers

MIAMI HERALD | MiamiHerald.com SE SUNDAY, OCTOBER 20, 2013 | 3SSE

NEIGHBORS CALENDAR

• CALENDAR, FROM 2SSE

with vendors, live music and DJ. 11 a.m. Oct. 20. News Lounge, 5580 NE Fourth Ct., Upper East Side. $10-$15. 786-990-9296.

Halloween Psychic Faire and Witches' Gathering: Honors our ancestors and those who watch over us in the world of spirits and asks them for their empowerment and protection. Features psychic readings, dream interpretation and spiritual healings. 1 p.m. Oct. 26. Celestial Treasures, 5444 Main Hwy. Suite 17, Coconut Grove. $25-$45. 305-461-2346.

Happy Hour: Through December, enjoy special drink nd food offers Wednesdays and Sundays. 6:30 p.m. Oct. 20. Villa Azur, 309 23rd St., Miami Beach. 305-765-8688. www.villaazurmiami.com

Hispanic Heritage Month Celebration-Dolphin Mall: Features 20 percent off at the mall's participating restaurants plus live performances by cultural acts representing Spain, Colombia, Mexico, Argentina, Bolivia, Venezuela, Cuba and Puerto Rico. 10 a.m. Oct. 22. Dolphin Mall, 11401 NW 12th St., Sweetwater. Free. 305-365-7446.

Happy Halloween @The DRB:

• TURN TO CALENDAR, 3TSE

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/PCCMasterPlan. Paper copies of the survey can be obtained at the Pinecrest Community Center.

Guido H. Inguanzo, Jr., CMC
Village Clerk

pccmasterplan@pinecrest-fl.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 Biggart-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

The Jensens Hit The Road Again - 5A

Revving Up For The Races 1B

SOUTH DADE NEWS LEADER

Vol. 101 No. 34 Friday, November 1, 2013 • 101 years of service to the South Dade community • Visit www.southdadenewsleader.com 50¢

Flood Insurance Changes Affect Locals

Cutler Bay Holds Town Hall Meeting

By Chris Himmel

Concerned for the consequences that new federal flood insurance rules could have on their properties, Cutler Bay residents attended the municipality's newly formed Flood Mitigation Advisory Committee's first Town Hall Meeting on October 24th at the Cutler Bay Town Hall Council Chambers. Brought forth as a result of legislative changes in the National Flood Insurance Program (NFIP) enacted in the Biggert-Waters Flood Insurance Reform Act of 2012, Cutler Bay officials estimate that about 300 local residential property owners will be affected.

According to a presentation made by Cutler Bay Community Development Department senior staff members, the Biggert-Waters Act (signed by President Barack Obama on July 6, 2012) is designed to stabilize the National Flood Insurance

See FLOOD 2A

Members of the Cutler Bay Town Council discuss changes to flood insurance in Florida. Photo courtesy Town of Cutler Bay

FLOOD

Continued from 1A

Program (established by the United States Congress in 1968); enabling it to exist by having actuarial soundness. The legislation reauthorizes the NFIP through September 30, 2017.

Among the Act's intended reforms are changes in flood insurance, mapping, mitigation programs, and levees. According to an April 2013 published Federal Emergency Management Agency (FEMA) document, 81% of flood insurance policy holders under the NFIP will not be impacted by the Act. Furthermore, according to the same documents the Act "encourages Program financial stability by eliminating some artificially low rates and discounts." The same documents also state that the U.S. Congress approved the Act "to make the NFIP more sustainable and financially sound over the long term."

The Cutler Bay flooding insurance Town Hall meeting rose out of portions of the Biggert-Waters Act taking effect on October 1st. Councilmember Sue Ellen Loyzelle expressed that the Act "has a regional impact in South Dade. Just in Cutler Bay alone it will affect over 300 homes." In a reflection of the wider geographic impact, Florida State Representative Holly Raschein (South Dade and the Keys) co-authored an October 24th dated letter sent to U.S. Senate Majority Leader Harry Reid of Nevada, Senate Minority Leader Mitch McConnell of Kentucky, Speaker of the U.S. House of Representatives John Boehner of Ohio, and House Minority Leader Nancy Pelosi of California requesting that the Biggert-Waters Act "be immediately suspended until such time as a reasonable method for instituting any rate increases can be determined." In her letter Raschein noted that in "the Florida Keys, a pending home sale stalled after receiving a quoted increase of more than $43,350 per year. At this time last year, the policy for this home was $695 per year."

In addition to the municipal charter authorized Flood Mitigation Advisory Committee, the Town of Cutler Bay has active flood mitigation management ordinances, participates in the NFIP Community Ratings System (which provides discounts to policy holders based on a number municipal efforts pertaining to flooding matters, Cutler Bay's rating enables at present for flood insurance policies there to get a 20% discount). As Councilmember Loyzelle noted, the Cutler Bay Town Council sent a letter to Florida Governor Rick Scott on the impact that the Act will have on Cutler Bay.

According to Cutler Bay Building and Code Compliance Division Manager Sandra Cuervo, even if they have federally subsidized rates with their premiums, residential property owners in the municipality will not have their flood insurance policies impacted by the Act if they do not sell their primary home (where they have to live 80% of the time), let their current policies lapse, do not buy new policies (after July 6th, 2012), or if they have not had a severe, repeated loss in past flood events.

Non-primary, secondary residence, investment properties, and commercial properties flood insurance policy holders in Cutler Bay will however be immediately affected with 25% annual rate increases until their rates reflect true flood risk.

Cutler Bay residents interviewed before and after the public meeting expressed their concerns on how the Biggert-Waters Act will impact them and their local community. As he is currently paying about $1,700 annually for flood insurance, homeowner Andy Moravec said "This will affect me drastically. I've had three different claims from localized street flooding in forty years. We've had flooding that entered the garage two other times. So when it rains heavy and we don't know when that's going to be, we mitigate by picking up everything off the floor."

A Cutler Bay resident since 1959, Art Nanni expressed his concern for how the legislation will impact the local real estate market, saying "I've known realtors who've lost closings because of flood insurance costs. Something has to be done. There has to be an equitable solution for all homeowners."

Michael Miller

EXECUTIVE EDITOR

AROUND TOWN

We hear from Sandra Cuervo that the Town of Cutler Bay's Floodplain Mitigation Plan Advisory Committee is inviting residents to join them for a meeting to talk about what the town is doing to protect property from flooding events. The town hopes to reduce the flood insurance rates of residents in Cutler Bay by implementing a Flood Mitigation Plan.

"Property owners that currently are required to have flood insurance, have experienced property loss or damage due to flood, or simply want to be informed are encouraged to attend the meeting," says Sandra, who is the Building & Code Compliance Division Manager, Department of Community Development.

"This will be the 2nd meeting of the advisory committee, and in this meeting the committee members will be getting information on what their functions and responsibilities are as members of the committee, and their schedules." The meeting is on Wednesday, December 11, from 5:30 p.m. to 7:00 p.m., in the Community Room, Suite 220, of the Cutler Bay Town Center, located at 10720 Caribbean Blvd. For information please contact Sandra Cuervo at 305-234-4262 or visit the Town's website at <www.cutlerbay-fl.gov>.

Kudos to the finance department, as we hear that the Town of Cutler Bay received a Certificate of Achievement for Excellence in Financial Reporting for the sixth consecutive year in a row. The award is presented by the Government Finance Officers Association of the United States and Canada ("GFOA") for its annual Comprehensive Annual Financial Report ("CAFR") for the fiscal year ending September 30, 2012. Quite an accomplishment for a community that was incorporated in 2005.

Great job... We hear from a reliable source that Steve Zarzecki, President of the Concerned Citizens of Cutler Bay, did a great job with the December 3rd meeting at the Cutler Ridge United Methodist Church. The church's Paella Fundraiser dinner preceding the meeting was a big hit with attendees. January's meeting should be interesting, too, with the election of officers.

Keep it up... Well, the official Small Business Saturday event has come and gone, but the idea behind it of supporting the neighborhood businesses in your community, the "mom and pop" independent stores, restaurants and services, is a great thing to do year 'round. They will appreciate your business and often provide better customer service than the big national chains. Besides, the money you spend there stays in the community and helps the local economy.

Holiday show... Those of you familiar with Actors' Playhouse at the Miracle Theatre may want to take the kids to see "Madeline's Christmas" there. There's an 'All Kids Included' Sensory-Friendly Saturday Performance on Saturday, December 14, 2013 at 11 a.m., and holiday performances on Saturday, December 21 at 7 p.m. and Sunday, December 22 at 3 p.m. The book and lyrics are by Jennifer Kirkeby, music and lyrics by Shirley Mier. This holiday favorite begins with the classic storybook line, "In an old house in Paris that was covered with vines lived twelve little girls in two straight lines."

Actors' Playhouse at the Miracle Theatre

Actors' Playhouse is located at the Miracle Theatre, 280 Miracle Mile, in Coral Gables. Call 305-444-9293 for ticket info or visit their website at <www.actorsplayhouse.org>.

Thought of the Day:

There is nothing in the world so irresistibly contagious as laughter and good humor.
— Charles Dickens,
A Christmas Carol

Gary Alan Rose contributed to this column.

Got any tips? Contact me at 305-669-7355, ext. 249, or send emails to <Michael@communitynewspapers.com>.

Remembrance Day - 3A

SOUTH DADE NEWS LEADER

Aligator Mating Season 7A

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50¢

Farm Bureau BBQ Saturday

Bill Losner HOF Induction, Harvest Queen Crowning Highlight Events For 2014

By Sonia Colon

Every year, Dade County honors an individual who has made an impact in Miami Dade agriculture at the Annual Barbeque and Fundraiser. At the 36th Annual Barbeque on April 26, 2014, Bill Losner will be inducted into the Hall of Honor for his outstanding contributions to agriculture. Dade County Farm Bureau is thankful to have had Bill Losner as an advocate for agriculture for so many years.

Bill Losner is a third generation Homestead resident. His grandfather, Max Losner helped open First National Bank in 1932 and became the bank president Bill followed in the footsteps of his grandfather and father and became a banker after graduating from South Dade High School in 1956.

His grandfather urged him to work in banking even though he initially wasn't interested in getting into the family business. However, he began working as a teller at 1st National Bank of South Florida. Glad he took his grandfather's advice, Bill Losner moved on to work for the Bank of Perrine and becoming president of the bank in 1974. After Bill's father retired from 1st National Bank in 1980, Bill Losner became president of the bank.

Jade Sanders will perform live at the annual Dade County Farm Bureau BBQ.

Bill Losner has been actively volunteering for the community his entire life. He is a member of Dade County Farm Bureau, Homestead/ Florida City Chamber of Commerce, and Rotary Club just to name a few. He has taken a particular interest in helping the farmers of Miami Dade County with several issues that have plagued the farming industry over the years.

"Everyone I grew up with was involved

See BBQ 2A

Weathering The Rising Tide

Federal Flood Insurance Changes Impact South Florida Residents

By Chris Himmel

The Town of Cutler Bay Floodplain Mitigation Plan Advisory Committee held its fifth meeting in on April 22nd at the Cutler Bay Town Center. The group organized in October 2013 is part of the municipality's efforts following Federal Emergency Management Agency (FEMA) requirements that ultimately can enable residential property holders discounts on insurance policies in the National Flood Insurance Program (NFIP). Points given by FEMA include municipal public outreach efforts.

See FLOOD 2A

David A. Stroud discusses Cutler Bay's flood mitigation plan at a recent Advisory Committee meeting. Photo by Chris Himmel

Coming Of Age

Some Seniors Don't Slow Down

By Marion Callahan and Gwen Shrift, Calkins Media

my body working." Arbani said minutes after she finished taking a Zumba dance class.

Baynanza Returns

Yearly Park Cleanup Enters 32nd Year of Service

By Denise Sleeper

Baynanza is Miami-Dade's way of celebrating one of the

suffering from pollution and the marine environment was in extreme decline. Every April, for the past 32 years

and Economic Resources (RER) and the Division of Environmental Resources Management (DERM) have organized Baynanza with contributions from sponsors

brations.

This year's Baynanza began March 16th at the Biscayne National Park Dante Fascell Visitor Center and has includ ed over 30 activities that will

FLOOD

Continued from 1A

Among the target audiences that will be reached out are the greater Cutler Bay community, developers and general contractors, homeowners associations, insurance/real estate agents, repetitive loss properties owners, school children, and Spanish language speakers (the Town has a significant Latin-American population). Stakeholders that will be reached out include Biscayne National Park, FEMA, Miami-Dade County, and the South Florida Water Management District. A Program for Public Information (PPI) is also planned.

According to Cutler Bay Mayor Edward P. MacDougall, the municipality has also received points for storm drainage improvements and elevation for homes built 2012 onwards from ten to eleven feet. As Mayor MacDougall commented, "In terms of Cutler Bay it's important that we get our homeowners the 20-25% premiums. It's a quality of life issue."

An example of the Town's outreach was evident in Cutler Bay residents Lloyd and Paulette Kossally's attendance. It was the S.W. 185th Terrace and S.W. 79th Court neighborhood residents' first time at the meetings.

"Neighbors have told us about the flooding that occurs at an adjoining lot. We have experienced it just after a heavy rain shower," Mr. Kossally expressed in an interview after the meeting's conclusion. Mrs. Kossally added "I found it very informative. It reinforced the need of having flood insurance where we are."

As the Cutler Bay Town Council's Liaison to the Committee, Councilmember Mary Ann Mixon expressed "Its going quite well. We're moving along, moving forwarding." Councilmember Mixon will report the Committee's April meeting to the Council at its May 21st meeting.

As the meeting approached its conclusion Consultant and Facilitator to the Committee David A. Stroud, a Certified Floodplain Manager at AMEC, stated that the next meeting would include mitigation strategies, as he specified "What can we do as a community to mitigate flood damage."

Following the meeting, in an interview Mr. Stroud expressed, "We're going through a strategic planning process to developing the Flood Mitigation Plan and we're basically in the middle stages of the ten step CRS (Community Rating System, part of the NFIP) and we're at this point presenting the Risk Assessment which identifies the flood hazards and the impact the hazards have on the community. We're looking at a finish in August 2014 for the final Flood Mitigation Plan."

Commenting on recent United States Congress passed revisions to the Biggert-Waters Flood Insurance Reform Act of 2012, Mayor MacDougall expressed "It's a good move, but after four years (2018) from now, it will be a full increase (for the residential properties)." Essentially, he sees the revisions as just delaying the flood insurance policies increase. He does see that actions such as Cutler Bay's are helpful in finding a final solution to the pending flood insurance crisis for owners of primary residencies.

As the Cutler Bay Floodplain Mitigation Plan Advisory Committee continues its work, Cutler Bay Building and Code Compliance Division Manager Sandra Cuervo pointed out its function "This is our fifth meeting. The main purpose is to develop a flood mitigation plan for which we received a Flood Mitigation Assistance (FMA) Grant, a FEMA grant administered by the State of Florida."

FMPC Meeting Pictures, Minutes and Sign-in Sheets

FMPC Meeting - October 24, 2013

FMPC Meeting - December 11, 2013

FMPC Meeting - February 20, 2014

FMPC Meeting – April 22, 2014

FMPC Meeting – July 17, 2014

Minutes

Town of Cutler Bay Flood Mitigation Plan Public Meeting

October 24, 2013

6:30 PM

The first public meeting for the Cutler Bay Flood Mitigation Plan began at 6:30 PM on Thursday, October 24th, 2013. The primary purpose of the meeting was to bring up-to-date information to residents on the implications of the Biggert-Waters 2012 National Flood Insurance Reform Act. According to a report from the Miami Herald, approximately 300 structures within Cutler Bay might be affected from the elimination of flood insurance premium subsidizes.

Julian Perez, AICP, CFM, Director of the Department of Community Development welcomed those residents in attendance and provided a brief overview of the agenda for the evening, including highlights of the Biggert-Waters 2012 National Flood Insurance Reform Act. Mr. Perez also mentioned that the Town Manager, Mr. Rafael Casals would be unable to attend the meeting due to a scheduling conflict. Mr. Perez then introduced the Mayor for the Town of Cutler Bay, the Honorable Ed MacDougall to provide some opening remarks

Mayor MacDougall welcomed everyone to the meeting for the flood mitigation plan and more importantly for the timely information concerning the 2012 National Flood Insurance Reform Act which took effect October 1, 2012. Mayor MacDougall was pleased that the Town had taken the initiative to provide this timely information as a public service to the residents of Cutler Bay. The Mayor emphasized that no legislation is perfect and trying to maintain the solvency of the NFIP which is important means that there were going to be some who would do much better than others. The Mayor has personally seen through his own company the ramifications of the Biggert-Waters Reform Act when the potential buyers for a property walked away after finding out the high cost for flood insurance. The owners of the property had already moved to Colorado and it did not appear that the home could be sold anytime in the near future.

Sandra Cuervo, CFM, Building Code Compliance Division Manager and Project Manager for the flood mitigation plan started a FEMA video on the 2012 National Flood Insurance Reform Act which gave a background on the NFIP including pervious reforms to the program. The video also went through the rationale behind the new law, who could be affected by the law and what measures property owners should take in light of this new legislation.

After the video finished, David Stroud, CFM consultant to the Town for this project began a Power Point presentation which had three separate parts. The first part touched on the Flood Mitigation Assistance (FMA) Program which was the program which funded the flood mitigation plan. The second part of the presentation dealt with the Community Rating System (CRS) Program and the savings the Town of Cutler Bay was currently receiving and what additional savings could be achieved through a better classification in the program. Mr. Stroud pointed to the map of the Special Flood Hazard Area (SFHA) which shows that approximately 60% of the entire Town is located in a high-hazard floodplain. This is an important reason why Cutler Bay benefits from the CRS Program. The Town of Cutler Bay is currently a CRS classification 6 which means that policy holders within the flood plain receive a 20 percent reduction on

the cost of flood insurance. The properties in the non-flood plain areas who maintain a standard X-Zone policy are eligible for a 10 percent reduction.

The final piece of the presentation dealt with the Biggert-Waters 2012 National Flood Insurance Reform Act (BW-12). Mr. Stroud presented an overview of the NFIP and BW-12, including a discussion of the various other parts of the legislation beyond flood insurance, the definition of a Pre-FIRM building, and how properties and policies are affected by the subsidy changes.

Mr. Stroud explained the various immediate implications of BW-12. These changes include:

Subsidized rates are eliminated for the following:

1. Policies on newly purchased Pre-Firm buildings
2. Policies issued for the first time on buildings in high-risk areas (no previous insurance)
3. Policies re-issued after a lapse in coverage

Subsidized rates are moving to full risk rates for the following (25% increase per year at renewal until full risk rates are achieved):

1. Non-primary residences (secondary or vacation homes)
2. Non-residential business buildings (in high-risk areas)
3. Previously flood residences (repetitive or severely repetitive in high risk areas)

Subsidized rates for primary residences can remain in place until the following happens:

1. Property is substantially improved
2. Property (1 -4 family) incurs severe repetitive loss status or receives insurance claim payments that exceed the property's value
3. Property is sold
4. Policy is allowed to lapse.

Mr. Perez indicated that the several amendments (changes) to BW-12 were being considered and some being brought forth from Congresswoman Ros-Lithen's office. Mr. Perez went on to indicate that things are changing quickly and there could be additional reforms to the legislation which would impact what was covered here this evening.

Several questions were generated from those in attendance.

The meeting ended at 8:45 PM

For office use only:

Date: 12/11/13
Approval of Minutes

Janice Rowton
Janice Rowton, Committee Chairperson

SHEET "A"

FLOOD MITIGATION ADVISORY COMMITTEE MEETING
THURSDAY, OCTOBER 24, 2013
SIGN-IN SHEET

Subject Flood Mitigation Advisory Committee Meeting **Meeting Date:** October 24, 2013

Facilitator: Town of Cutler Bay **Place/Room:** Town Hall Council Chambers

First & Last Name	Phone	E-Mail
C. HINNEL		
Janice Ronton	305 753 6891	
DAN VESCE	305 232 3344	
Luis A. Badillo	305 510-8610	
Andrew Moravec	305 233-0700	andymoravec@comcast.net
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JORGE ACEVEDO	305 962 8438	jacevedo2@coralgables.com
Jannek Cederberg	305-776-5028	jcederberg@cumminscederberg.com
Rick Cummings	786-236-2229	muttonmon@aol.com
Judy Invernizzi	305-498-0539	Lynvern@yahoo.com
Barbara Lecher	305-232-0108	
RON Derrick	7/457-4339	ron@choiceone.us
ART Nannì	5/542-0702	Art2046@gmail.com
MEL MONTAGNE	305-310-8300	mmontagne@keyinsurance.com
BEATRIZ BALDAN	305-878-4880	BEATRIZ@MBDLLC.COM
SUE Loyzelle		Town of Cutler Bay

First & Last Name	Phone	E-Mail
GILBERT LEAL	786-346-8190	

Minutes

Town of Cutler Bay Flood Mitigation Plan Advisory Committee Meeting

December 11, 2013

5:30 PM

The Cutler Bay Flood Mitigation Plan Advisory Committee Meeting began promptly at 5:30 PM on Wednesday, December 11th, 2013. The meeting was called to order and the Pledge of Allegiance was said.

The chairperson of the Advisory Committee, Janice Rowton determined that a quorum of the Advisory Committee were present so that a meeting could be held. Janice Rowton asked for any comments on the October 24th meeting minutes. Hearing no comments, Ms Rowton asked for a motion to approve the October minutes. Luis Badillo made a motion to approve the meeting minutes as written with a second by Janice Rowton. The October minutes were approved by a majority voice vote.

David Stroud with AMEC provided a program overview which gave a history of the project from the beginning to the December meeting. The overview included the following points:

- The Town of Cutler Bay prepares a Flood Mitigation Assistance (FMA) grant application to develop a flood mitigation plan to meet the Disaster Mitigation Act (DMA) and Community Rating System (CRS) planning requirements.
- FEMA Region IV and the State of Florida awarded one of two FMA grants in the state to the Town of Cutler Bay (75% federal funding and 25% local match). The local match can include in-kind services of staff time and effort throughout the planning process.
- AMEC was selected through an open bidding process to facilitate and help prepare the flood mitigation plan.
- The Town Charter requires that a "public" Advisory Committee be put in charge of the planning process and development of the flood mitigation plan. A five member Advisory Committee was selected from an open call to serve.
- Council Member Mary Ann Mixon was appointed by the Town Council to serve as liaison to the Advisory Committee.
- Mission statements, goals, objectives, and program activities are developed by the staff to guide the Advisory Committee.
- A kick-off meeting was held on October 24th discussing the Biggert-Waters 2012 National Flood Insurance Reform Act and the basics of the flood mitigation planning process focusing upon the requirements of the CRS program

Mrs. Debra Eastman Town Clerk provided a detailed overview and explanation of the Florida's Sunshine Law which requires that all meetings are open to the public for participation and comments. Chapter 286 of the Florida Statues establishes a public "right of access" to most meetings of boards, commissions, and other governing bodies of state and local governmental agencies and authorities. Mrs. Eastman explained that all Advisory Committee meetings must be publically noticed at a minimum, this includes posting notice of the meetings on the Town's bulletin board. Additionally, Mrs. Eastman informed the Advisory Committee members that they should not discuss the contents of an Advisory Committee outside of the officially publicized Advisory Committee meetings as it could constitute a meeting without proper notice.

Mrs. Eastman went on to indicate a number of communities in the state which have been fined for holding meetings without proper notice.

Mr. Stroud with AMEC discussed the Advisory Committee's functions and responsibilities. The functions and responsibilities of the Advisory Committee are the goals, objectives and program activities which were developed to guide them.

An overview of the Community Rating System (CRS) program – which the Town depends on to offset the increased coast of flood insurance and an overview of the flood mitigation plan. Cutler Bay is currently a CRS Classification 6 which reduces the cost of flood insurance premiums for those policies in the Special Flood Hazard Area (SFHA) by 20 percent. The CRS portion of the presentation went on to explain some of the benefits to participating in the CRS program, the goals of the CRS, and the four series of CRS activities.

The presentation went on to describe the development of the flood mitigation plan. This portion of the presentation explained why a flood mitigation plan is necessary which includes more people in high risk areas, more structures in high risk areas and the increasing number and cost of natural disasters. The presentation continued with a description of the four phases of DMA and how they relate and fit in the ten CRS planning steps. The four phases of DMA are:

- Planning Process – Phase 1 CRS planning steps 1, 2 and 3
- Risk Assessment – Phase 2 CRS planning steps 4 and 5
- Mitigation Strategy – Phase 3 CRS planning steps 6, 7 and 8
- Plan Maintenance – Phase 4 CRS planning steps 9 and 10

Mr. Stroud provided an overview of the Program for Public Information and how it fits into the CRS ten step planning process. The Program for Public Information (PPI) is on ongoing public information effort to design and transmit the messages the community determines that are most important to its flood safety and the protection of its floodplain's natural functions. The Flood Mitigation Advisory Committee will serve as the committee required to develop the PPI. The next step for this process is to complete an assessment of the community's public information needs.

Three major elements make up the "Scope of Work" for the Flood Mitigation Advisory Committee. These include:

- Fulfill the functions and responsibilities of membership to the Advisory Committee
- Inform the public and other agencies and interested parties about the planning process
- Complete homework assignments

Mr. Stroud concluded with a listing of the scheduling of tasks and next steps in the planning process. The scheduling of tasks is applying approximate dates of completion for the 10 CRS planning steps. This is available for examination in the Building Department. The next planning steps include:

- Develop a comprehensive list of flood problems throughout the town and watersheds
- Assess Cutler Bay's public information needs
- Coordinate with other agencies and organizations

One member of the public attended the meeting but left before the opening of public comments. Additionally, the following Town staff members were present: Council Member Mixon, Town Manger – Rafael G. Casals, Public Works Director –Alfredo Quintero, Stormwater utility Manager – Yenier Vega and Building & Code Compliance Division Manager – Sandra Cuervo.

The meeting adjourned at approximately 7:10 PM.

For office use only:

Date: 01/16/14
Approval of Minutes

Jorge Acevedo
~~Janice Rowton~~, Committee Chairperson
JORGE ACEVEDO

SHEET "A"

FLOOD MITIGATION ADVISORY COMMITTEE MEETING
WEDNESDAY, DECEMBER 11, 2013
SIGN-IN SHEET

Subject Flood Mitigation Advisory Committee Meeting **Meeting Date:** December 11, 2013

Facilitator: Town of Cutler Bay **Place/Room:** Town Center Community Room

First & Last Name	Phone	E-Mail
Janice Rowton	305 753-6891	janice.rowton.icgb@statefarm.com
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Sandra Cueno	305-234-4262	Scueno@cutlerbay-fl.gov
RAFAEL G. CASALS	305/234-4262	RCASALS@cutlerbay-FL.gov
Debra Eastman	305/234-4262	deastman@cutlerbay-fl.gov
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LUIS A. BADILLO	305-510-8610	Luisbadilloekw..com
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JORGE ACEVEDO	305/460 5000	jacevedo2@Coralgables.com
YENIER VEGA	305/234-4262	YVEGA@CUTLERBAY-FL.GOV
PAUL MAURIELLO	305/331/2242	MAURIELO@MIAMIDADE.GOV

Minutes

Town of Cutler Bay Flood Mitigation Plan Advisory Committee Meeting

January 16, 2014

5:30 PM

The Cutler Bay Flood Mitigation Plan Advisory Committee Meeting began at approximately 5:40 PM on Thursday, January 16th, 2014. The meeting was called to order and the Pledge of Allegiance was said.

The chairperson of the Advisory Committee, Janice Rowton was unable to attend; however the Vice Chairperson, Jorge Acevedo proceeded over the meeting. A quorum of the Advisory Committee were present so that a meeting could be held. Jorge Acevedo asked for any comments on the December 11th meeting minutes. Hearing no comments, Mr. Acevedo asked for a motion to approve the October minutes. Luis Badillo made a motion to approve the meeting minutes as written with a second by Paul Mauriello. The December minutes were approved by a voice vote.

David Stroud with AMEC proceeded with a discussion of agenda item 3 which was the "Homework" assignment given to the Advisory Committee. The committee discussed local flooding concerns within the Town of Cutler Bay. Luis Badillo, Paul Mauriello and Jorge Acevedo all mention particular areas of the town which has flooded in the past. Paul Mauriello even mentioned that during a past storm, his garage had flooded, but the flood waters did not enter his home.

The Advisory Committee members went on to discuss various flood protection and flood safety publications and outreach materials which they have noticed which were not developed by Cutler Bay. Flood outreach materials developed by Miami-Dade County, the State of Florida, and FEMA were evaluated and discussed. Some members mentioned commercials from the National Flood Insurance Program promoting flood insurance.

Mr. Stroud continued with agenda item 4 where he discussed the different types of plans, ordinances and studies created by the Town of Cutler Bay which will be used in developing the risk assessment for the flood mitigation plan. The Advisory Committee received a CD with of all of the plans, studies, and ordinances in their materials packet. In particular, Mr. Stroud noted the Repetitive loss Area Analysis (RLAA) and the definition of both Repetitive Loss and Severe Repetitive Loss. Mr. Stroud indicated that FEMA is concerned about these properties since a small number of them costs' the national flood insurance fund substantial dollars. Other materials mentioned were the Flood Insurance Rate Map and Flood Insurance Study, Stormwater Management Master Plan, Flood Damage Prevention Ordinance and Capital Improvements Plan.

For agenda item 5, the Advisory Committee was asked to evaluate and assess the Town of Cutler Bay's public information needs. This was an exercise that looked at all of the materials, websites and other types of public information materials that the Town, and in particular the Department of Public Works, has developed to help the residents prepare for flood events, hurricanes and other associated hazards. The Department of Public Works played a CD with various flood information public service announcements developed by FEMA, the EPA and other entities which they played to audiences at events such as "Movies vies in the Park" and at other events.

Other public information materials were discussed by Alfredo Quintero and Yenier Vega and then presented to the Advisory Committee Members. These materials are also distributed by the Public Works Department when they are working in a neighborhood. They also have door hangers were materials can be left on a door.

For the final item on the agenda, Mr. Stroud discussed the coordination letter for other agencies and stakeholders and the distribution list for that letter. This coordination effort is part of Step 2 in the Floodplain Management Planning Process. Over 30 stakeholders were included on the distribution list.

Mr. Stroud then asked the Advisory Committee members to prepare two items for the next meeting. First was to think of which groups should be targeted as part of the Program for Public Information. These target groups could be children, Spanish speaking persons, elderly, builders, etc. Second, Mr. Stroud asked the Advisory Committee members to review the CD with the various plans, studies and ordinances before the next meeting.

No member of the public attended the meeting. Those in attendance included: Sandra Cuervo, Alfredo Quintero, Yenier Vega, David Stroud, Jorge Acevedo, Luis Badillo, and Paul Mauriello.

The meeting was adjourned at 7:00 PM.

For office use only:

Date: 2/20/14
Approval of Minutes

Janice Rowton
Janice Rowton, Committee Chairperson

SHEET "A"

FLOOD MITIGATION ADVISORY COMMITTEE MEETING
THURSDAY, JANUARY 16, 2014
SIGN-IN SHEET

Subject Flood Mitigation Advisory Committee Meeting **Meeting Date:** January 16, 2014

Facilitator: Town of Cutler Bay **Place/Room:** Town Center Community Room

First & Last Name	Phone	E-Mail
Sandra Cuervo	3/234-4262	Scuervo@cutlerbay-fl.gov
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LUIS A. BADILLO	3/570-8610	Luisbadillo@kw.com
JORGE ACEVEDO	3/962 8438	Jacevedo2@coralgables.com
Paul Mauriello	3/251-7675	Paulmauriello@bellsouth.net
ALFREDO QUINTERO	3/234-4262	AQUINTERO@CUTLERBAY-FL.GOV
Yenier Vega	3/234-4262	YVEGA@CUTLERBAY-FL.GOV

Minutes

Town of Cutler Bay Flood Mitigation Plan Advisory Committee Meeting

February 20, 2014

5:30 PM

The Cutler Bay Flood Mitigation Plan Advisory Committee Meeting began at 5:30 PM on Thursday, February 20th, 2014. The meeting was called to order and the Pledge of Allegiance was said.

The chairperson of the Advisory Committee, Janice Rowton presided over the meeting. A quorum of the Advisory Committee were present so that a meeting could be held. Janice Rowton asked for any comments on the January 16th meeting minutes (agenda item 2). Hearing no comments, Ms. Rowton asked for a motion to approve the January minutes. Luis Badillo made a motion to approve the meeting minutes as written with a second by Dan Vesce. The January minutes were approved by a voice vote. David Stroud introduced Sarah Bellmund with the Biscayne National Park and Council member Mary Ann Mixon who is the Council Liaison to the Floodplain Management Technical Advisory Committee.

David Stroud with AMEC proceeded with a discussion of agenda item 3 which was a review of the January Advisory Committee meeting as two members of the committee were absent at the January meeting. This review included the "Homework" assignment given to the Advisory Committee to identify and local flood problems experienced within Cutler Bay and to describe any local, state, or federal publications on how you can prepare for flooding or protect your family or your property. The materials to be utilized in the Risk Assessment were highlighted again, as well as, Cutler Bay's Communication Advisory Committee Report.

Agenda item 4 was an up-to-date review of the Public Survey results. Mr. Stroud gave a brief overview of the surveys received to date. As of February 18th 42 surveys had been completed (16 from Chili Days and 26 from the Town's website). From the 42 respondents to date, 44.95% indicated they had experienced high water or flooding in Cutler Bay.

Mr. Stroud continued with agenda item 5 where he discussed a form that can be used to document for CRS purposes meetings or phone discussions with other agencies, groups or stakeholders. This form can be used by community staff or members of the Technical Advisory Committee to document discussions about the flood mitigation plan with other groups, stakeholders, etc. For example, if Public Works goes to meet with a homeowner's association and they discuss the flood mitigation plan, this meeting can be documented on this form and it will be counted as coordinating with other agencies under CRS Step 3 where 30 points of credit are available for outside coordination.

For agenda item 6, the Technical Advisory Committee was asked to identify on a map the location of flood problems within the Town of Cutler Bay. Each Technical Advisory Committee member was asked to circle locations where localized flood problems exist (hot spots). Approximately 17 locations were identified by members of the Technical Advisory Committee and member of the Public Works Department. Alfredo Quintero indicated that he is aware of most locations within the Town which experience localized flooding. Mr. Quintero indicated that pervious flooding on Old Cutler Road has been correct through a capital improvements project and other areas of the Town will be improved in the future.

Agenda item 7 was an additional assessment of the Town's public information needs. Mr. Stroud worked with the Technical Advisory Committee members to identify other non-flood programs such as automobile safety or home improvements where the Town could leverage flood outreach topics. Many ideas surfaced through this process. Also, the committee was asked to think of other activities where flood information and messaging could be provided such as ongoing events and organizations, etc. This information will be incorporated into the Program for Public Information.

Mr. Stroud then worked with the Technical Advisory Committee on agenda item 8 on a discussion of target audiences and stakeholders that will be used in the Program for Public Information. Target audiences are those groups that should be directed for outreach such as landscapers who blow leaves and debris into inlets which creates localized flooding. Stakeholders are groups such as FEMA who provide good outreach publications that can be used to reach target audiences and residents in general.

Those in attendance included: Sandra Cuervo, Alfredo Quintero, Yenier Vega, David Stroud, Jorge Acevedo, Luis Badillo, Janice Rowton and Dan Vesce. Sarah Bellmund from the Biscayne National Park, Cutler Bay Council member Mary Ann Mixon, and a citizen were also in attendance.

The meeting was adjourned at 7:00 PM.

For office use only:

Date:_____
Approval of Minutes

Janice Rowton
Janice Rowton, Committee Chairperson

SHEET "A"

FLOOD MITIGATION ADVISORY COMMITTEE MEETING
THURSDAY, FEBRUARY 20, 2014
SIGN-IN SHEET

Subject Flood Mitigation Advisory Committee Meeting **Meeting Date:** February 20, 2014

Facilitator: Town of Cutler Bay **Place/Room:** Town Center Community Room

First & Last Name	Phone	E-Mail
Janice Rowton	305 453 6891	janice.rowton.icgb@statefarm.com
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DAN VESCE	305 2323344	HM1INSPR@AOL.Com
Luis A. Badillo	305-510-8610	Luisbadillo@kw.com
Mary Ann Mixon	786-3081601	
Sonia P. Ambrose	3055622075	spatra@msn.com
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YENIER VEGA	305-234-4262	YVEGA@CUTLERBAY-FL.GOV

Minutes

Town of Cutler Bay Flood Mitigation Plan Advisory Committee Meeting

April 22, 2014

5:30 PM

The Cutler Bay Flood Mitigation Plan Advisory Committee Meeting began at 5:30 PM on Tuesday, April 22nd, 2014. The meeting was called to order by Chairperson Janice Rowton and the Pledge of Allegiance was said.

The chairperson of the Advisory Committee, Janice Rowton presided over the meeting. It was determined based on a roll call that a quorum of the Advisory Committee was present so that the meeting could take place. Janice Rowton asked for any comments on the February 20th meeting minutes (agenda item 2). Mr. Paul Mauriello indicated that he was not present at the February Advisory Committee meeting and should be removed from those listed as present. Hearing no other comments, Ms. Rowton asked for a motion to approve the February minutes. Luis Badillo made a motion to approve the meeting minutes with changes. The motion was seconded by Janice Rowton. The February minutes were approved by a voice vote. David Stroud introduced Mayor Ed MacDougall and Council member Mary Ann Mixon who is the Council Liaison to the Floodplain Management Technical Advisory Committee.

David Stroud with AMEC proceeded with a discussion of agenda item 3 which was a review of the Hazard Identification and Risk Assessment (HIRA) for the Town's floodplain mitigation plan. Mr. Stroud explained the purpose of a HIRA or risk assessment. The risk assessment phase of the Disaster Mitigation Act includes CRS Planning steps 4 (Assess the hazards) and 5 (Assess the Problem). The purpose of the HIRA is to identify the flood hazards that could affect the town such as the 100-year, 500-year, stormwater (localized), hurricane and tropical storm, coastal and canal bank erosion, and climate change and sea-level rise.

Mr. Stroud asked the Technical Advisory Committee along with Town's staff to provide their assessment of the various flood-related hazards in terms of the frequency of occurrence, spatial extent, potential magnitude, and significance which are qualitative analyses. The results of the profiling of the flood hazards will be used to further define the HIRA and help guide which mitigation strategies might be used to address the various flood hazards.

Mr. Stroud continued with the presentation of the risk assessment. A discussion of past flooding events that have impacted Miami-Dade County and the Town of Cutler Bay were presented. Mr. Stroud indicated that since Cutler Bay incorporated in 2005, there is very little specific past flooding data. Mr. Stroud also mentioned that these past reported flooding events are only those that were reported to NOAA or those that NOAA knew about. Many flooding events which are not part of a disaster declaration go unreported.

Based on property assessors data from Miami-Dade County, there are approximately 10,221 parcels within Cutler Bay are located within either the AE, AH, and VE Flood Zones. There and just over 9.500 improved parcels within the AE and AH Flood Zones. There are no improved parcels within the VE-Zone. The total exposure for those improved parcels in the AE and AH Zones is more than $3.1 billion. The risk assessment also looked at the loss estimation for the 1 percent chance (100-year) flood. Based

on the Hazus – FEMA's loss estimation tool and utilizing the Galveston Depth Damage Curve, it is estimated that if Cutler Bay were to have a 1% chance flood that the total loss would be more than $570 million for that one event based on that depth of flooding and the number of structures affected by that depth of flooding..

Mr. Stroud showed a map created which shows the depth of flooding for each parcel in the town based on the 1 percent chance flood. The ranges are from 0 to 3 feet of flood depth, 3 to 6 feet of flood depth, 6 to 10 feet of flood depth and over 10 feet of flood depth. The average depth of flooding based on the 1 percent chance flood ranges from 2.5 feet to 18 feet throughout the town.

Areas of localized stormwater flooding were identified on a map and the associated streets and intersections were also indicated. The repetitive loss properties (those properties which have two or more paid claims against the NFIP of $1,000 or more in any 10-year period) were also mapped against the localized stormwater flooding areas. Many of the repetitive loss properties were in close proximity to these areas of localized stormwater flooding. It should be noted that some of these areas may have private streets which the town cannot enter to perform maintenance work.
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The major canals within the Town's jurisdiction were also included in a map. The purpose of the canals was explained including the goal of maintaining the elevation of the groundwater table to prevent the infiltration of saltwater intrusion. Town Manager Rafael Casals indicated that a Hazard Mitigation Grant Program (HMGP) grant of more than $3 million in conjunction with Miami-Dade County will widen the bridge under the canal (C-1) in the C-100 Basin to eliminate clogging and blockages and to allow the canal system to operate from without restrictions.

The presentation went on to identify the undeveloped parcels within the town and how many remain within each type of flood zone. This information will help the town to decide where to build and what types of properties should and should not be developed. The number of acres of properties in the floodplain were identified both by occupancy type and flood zone.

The critical and essential facilities were plotted on a map to show which ones are located in the 1 percent chance annual flood as well as the depth of flooding on for each facility. Finally, Mr. Stroud presented detailed information on the flood insurance policy data base which indicated the Town of Cutler Bay has more than 3,300 flood insurance policies in force. Mr. Stroud answered questions from the committee and those in attendance.

Paul Mauriello made a motion to adjourn the meeting. The motion was seconded by Luis Badillo. The motion to adjourn was agreed based on a voice vote.

Those in attendance included: Sandra Cuervo, Alfredo Quintero, Yenier Vega, David Stroud, Jorge Acevedo, Luis Badillo, Janice Rowton, and Paul Mauriello. Mayor Ed MacDougall and Council member Mary Ann Mixon were elected members from the Town. Four citizens were also in attendance for the meeting.

The meeting was adjourned at 7:00 PM.

SHEET "A"

FLOOD MITIGATION ADVISORY COMMITTEE MEETING
TUESDAY, APRIL 22, 2014
SIGN-IN SHEET

Subject Flood Mitigation Advisory Committee Meeting **Meeting Date:** April 22, 2014

Facilitator: Town of Cutler Bay **Place/Room:** Town Center Community Room

First & Last Name	Phone	E-Mail
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PAULETTE KOSSALLY	305 992 6596	PKossally@Gmail.com
C. HIMMEL		SOUTH DADE NEWS LEADER PALMETTO BAY TO UPPER KEYS
Sandra Cuervo	305/234-4262	SCUERVO@cutlerbay-fl.gov.
DAVID A. STROUD	919/325-6417	DAVID.STROUD@AMEC.COM

Minutes

Town of Cutler Bay Flood Mitigation Plan Public Meeting

April 23, 2014

7:00 PM

The Town of Cutler Bay held a public meeting on the development of the Floodplain Mitigation Plan to provide the public with an opportunity to understand the causes of flooding in the Town and associated impacts on people, structures and local infrastructure. The public meeting was held at Cutler Ridge Park on Wednesday, April 23rd, 2014 at 7:00 PM. The meeting was called to order and the Pledge of Allegiance was said.

The Town Manager – Rafael Casals was present for this public meeting along with Councilmember Mary Ann Mixon who is the Council Liaison to the Floodplain Management Technical Advisory Committee and Councilmember Peggy Bell. Sandra Cuervo, Alfredo Quintero, and Yenier Vega from the Town of Cutler Bay were also present. Three members of the public were also present for the meeting.

David Stroud with AMEC proceeded with a discussion of the Hazard Identification and Risk Assessment (HIRA) which is also called the Risk Assessment. Mr. Stroud explained the purpose of a HIRA or risk assessment. The risk assessment phase of the Disaster Mitigation Act includes CRS Planning steps 4 (Assess the hazards) and 5 (Assess the Problem). The purpose of the HIRA is to identify the flood hazards that could affect the town such as the 100-year, 500-year, stormwater (localized), hurricane and tropical storm, coastal and canal bank erosion, and climate change and sea-level rise.

Mr. Stroud explained that the Technical Advisory Committee along with Town staff to provided their assessment of the various flood-related hazards in terms of the frequency of occurrence, spatial extent, potential magnitude, and significance which are qualitative analyses. The results of the profiling of the flood hazards will be used to further define the HIRA and help guide which mitigation strategies might be used to address the various flood hazards in the Town.

Mr. Stroud continued with the presentation of the risk assessment. A discussion of past flooding events that have impacted Miami-Dade County and the Town of Cutler Bay were presented. Mr. Stroud indicated that since Cutler Bay incorporated in 2005, there is very little specific past flooding data. Mr. Stroud also mentioned that these past reported flooding events are only those that were reported to NOAA or those that NOAA knew about. Many flooding events which are not part of a disaster declaration go unreported.

Based on property assessors data from Miami-Dade County, there are approximately 10,221 parcels within Cutler Bay are located within either the AE, AH, and VE Flood Zones. There and just over 9.500 improved parcels within the AE and AH Flood Zones. There are no improved parcels within the VE-Zone. The total exposure for those improved parcels in the AE and AH Zones is more than $3.1 billion. The risk assessment also looked at the loss estimation for the 1 percent chance (100-year) flood. Based on the Hazus – FEMA's loss estimation tool and utilizing the Galveston Depth Damage Curve, it is estimated that if Cutler Bay were to have a 1% chance flood that the total loss would be more than $570 million for that one event based on that depth of flooding and the number of structures affected by that depth of flooding..

Mr. Stroud showed a map created which shows the depth of flooding for each parcel in the town based on the 1 percent chance flood. The ranges are from 0 to 3 feet of flood depth, 3 to 6 feet of flood depth, 6 to 10 feet of flood depth and over 10 feet of flood depth. The average depth of flooding based on the 1 percent chance flood ranges from 2.5 feet to 18 feet throughout the town.

Areas of localized stormwater flooding were identified on a map and the associated streets and intersections were also indicated. The repetitive loss properties (those properties which have two or more paid claims against the NFIP of $1,000 or more in any 10-year period) were also mapped against the localized stormwater flooding areas. Many of the repetitive loss properties were in close proximity to these areas of localized stormwater flooding. It should be noted that some of these areas may have private streets which the town cannot enter to perform maintenance work.

.

The major canals within the Town's jurisdiction were also included in a map. The purpose of the canals was explained including the goal of maintaining the elevation of the groundwater table to prevent the infiltration of saltwater intrusion. Town Manager Rafael Casals indicated that a Hazard Mitigation Grant Program (HMGP) grant of more than $3 million in conjunction with Miami-Dade County will widen the bridge under the canal (C-1) in the C-100 Basin to eliminate clogging and blockages and to allow the canal system to operate from without restrictions.

The presentation went on to identify the undeveloped parcels within the town and how many remain within each type of flood zone. This information will help the town to decide where to build and what types of properties should and should not be developed. The number of acres of properties in the floodplain were identified both by occupancy type and flood zone.

The critical and essential facilities were plotted on a map to show which ones are located in the 1 percent chance annual flood as well as the depth of flooding on for each facility. Finally, Mr. Stroud presented detailed information on the flood insurance policy data base which indicated the Town of Cutler Bay has more than 3,300 flood insurance policies in force. Mr. Stroud answered questions from the committee and those in attendance.

The meeting adjourned at approximately 8:30 PM.

For office use only:

Date: 7/17/14
Approval of Minutes

Janice Rowton
Janice Rowton, Committee Chairperson

SHEET "A"

FLOOD PLAIN MITIGATION PLAN PUBLIC MEETING
TUESDAY, APRIL 23, 2014
SIGN-IN SHEET

Subject Flood Mitigation Public Meeting **Meeting Date:** April 23, 2014

Facilitator: Town of Cutler Bay **Place/Room:** Cutler Ridge Park

First & Last Name	Phone	E-Mail
RAFAEL G. CASALS	(305) 234-4262	RCASALS@CUTLERBAY-FL.GOV
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SUE Loyzelle	3055626062	sloyzelle@cutlerbay-fl.gov
Mary Ann Mixon	786-308-1601	mamixon@cutterbay-fl.gov
PEGGY Bell	305-322-5305	pbell@cutlerbay-fl.gov

Minutes

Town of Cutler Bay Flood Mitigation Plan Advisory Committee Meeting

July 17, 2014

5:30 PM

The Cutler Bay Flood Mitigation Plan Advisory Committee Meeting began at 5:30 PM on Thursday, July 17th, 2014 (A meeting was scheduled for June 11th; however, a quorum was not present so that meeting could not be held). The meeting was called to order by Chairperson Janice Rowton and the Pledge of Allegiance was said.

The chairperson of the Advisory Committee, Janice Rowton presided over the meeting. It was determined based on a roll call that a quorum of the Advisory Committee was present so that the meeting could take place. Janice Rowton asked for any comments on the April 22nd meeting minutes (agenda item 2). Hearing no request for changes to the minutes, Ms Rowton asked for a motion to approve. Mr. Paul Mauriello indicated a motion to approve the April 22nd minutes with a second by Ms. Janice Rowton. The minutes were approved with a voice vote.

Ms. Sandra Cuervo led a discussion of agenda item 3 covering the absence policy for advisory committee members. The Town Ordinance which covers unexcused absences from advisory committee members was included in the agenda packet. If an advisory committee member misses more than 3 times, he or she will be removed from the advisory committee and replaced by the Town Council. Council Liaison Ms. Mary Ann Mixon will bring this issue up at the next council meeting to see if a replacement can be made for a current member of the Flood Mitigation Plan Advisory Committee who has missed more than 3 times. A discussion of the policy governing committee members was held.

David Stroud with AMEC indicated that he would like to have comments on the hazard identification and Risk Assessment (HIRA) no later than July 30th. Mr. Stroud indicated that committee members and staff should provide all comments to Sandra Cuervo who will forward them all at one time. Mr. Stroud indicated that the comments could be through track changes on the word document or they could be provided separately.

Mr. Stroud then proceeded with agenda item 4 to set goals for the flood mitigation plan. Mr. Stroud asked the Technical Advisory Committee along with Town's staff to review the first document – "What would you like to see most in Cutler Bay's Future." Mr. Stroud then asked to write down their top three answers (and answers could include ideas not on the list). Mr. Stroud then revealed everyone's responses and put them in categories upon the wall. Next, Mr. Stroud asked to review the second document – "What should be the goals of our mitigation program." Mr. Stroud then asked each to provide their top three answers. Mr. Stroud then revealed everyone's responses and placed those within categories upon the wall. By looking at what is important for the future of Cutler Bay along with potential goals, a direction for the floodplain mitigation plan can be established. An interactive discussion was held for both sections of establishing goals for the floodplain mitigation plan. Mr. Stroud indicated that he would refine the goals and bring them back to the committee for review.

Mr. Stroud continued with agenda item 5 to come up with mitigation projects for plan. Mr. Stroud provided a brief overview of the six mitigation categories of Prevention, Property Protection, Natural

Resource Protection, Emergency Services, Structural Projects, and Public Information. Within each of these mitigation categories, Mr. Stroud then provided examples of projects that would fit within each of these categories. To receive maximum credit in the CRS Program, the mitigation action plan must include projects from at least five of the six categories. Once a project is identified, it must include who will be responsible for implementation, when will the project be completed, and how will the project be financed. The projects must also be prioritized and evaluated based on the STAPLEE criteria or other similar methodology. Mr. Stroud also mentioned that each mitigation project has to meet one of the established goals of the plan.

Mr. Stroud facilitated a brainstorming session on potential mitigation projects asking committee members along with Town staff to indicate what projects could fit under each mitigation category. Through this discussion, several potential mitigation projects were brought forth for inclusion in the action plan. Mr. Stroud also indicated that he would develop the projects into a format that would meet the CRS requirements.

Janice Rowton made a motion to adjourn the meeting. The motion was seconded by Luis Badillo. The motion to adjourn was agreed based on a voice vote.

Those in attendance included: Sandra Cuervo, Alfredo Quintero, Yenier Vega, David Stroud, Jorge Acevedo, Luis Badillo, Janice Rowton, Paul Mauriello, and Council member Mary Ann Mixon..

The meeting was adjourned at 7:20 PM.

For office use only:

Date: 9/25/14
Approval of Minutes

Janice Rowton
Janice Rowton, Committee Chairperson

SHEET "A"

FLOOD MITIGATION ADVISORY COMMITTEE MEETING
THURSDAY, JULY 17, 2014
SIGN-IN SHEET

Subject Flood Mitigation Advisory Committee Meeting **Meeting Date:** July 17, 2014

Facilitator: Town of Cutler Bay **Place/Room:** Town Center Community Room

First & Last Name	Phone	E-Mail
Sandra Cuenco	305-234-4262	Scuenco@cutlerbay-fl.gov.
DAVID STROUD	919-325-6497	david.stroud@amec.com
Janice Rowton	305753 6891	janice.rowton.icgb@statefarm.com
Mary Ann Mixon	786-308-1601	mamixon@cutlerbay-fl.gov.
Jorge Acevedo	305 460 5003	jacevedo2@coralgables.com
Abel Manzueco	305-514-6623	[illegible]
Luis A. Badillo	305-510-8610	Luisbadillo@kw.com
YENIER VEGA	3/234-4262	YVEGA@CUTLERBAY-FL-GOV
ALFREDO QUINTERO	3/234-4262	AQUINTERO@CUTLERBAY-FL-GOV

DRAFT Minutes

Town of Cutler Bay Flood Mitigation Plan Advisory Committee Meeting

September 25th, 2014

5:30 PM

The Cutler Bay Flood Mitigation Plan Advisory Committee Meeting began at 5:40 PM on Thursday, September 25th, 2014. The meeting was called to order by Chairperson Janice Rowton and the Pledge of Allegiance was said.

The chairperson of the Advisory Committee, Janice Rowton presided over the meeting. It was determined based on a roll call that a quorum of the Advisory Committee was present so that the meeting could take place. Janice Rowton asked for any comments on the July 17th meeting minutes. Hearing no request for changes to the minutes, Ms Rowton asked for a motion to approve. Mr. Paul Mauriello indicated a motion to approve the July 17th minutes with a second by Mr. Jorge Acevedo. The minutes were approved with a voice vote.

Ms. Janice Rowton turned the meeting over to David Stroud with AMEC. David presented details of the final "draft" Floodplain Mitigation Plan.

Mr. Stroud discussed the objectives of the meeting in terms of the review of the final plan which included:

- Describing the planning process
- Review Flood Hazard Problems
- Review Flood Hazard Impacts
- Review Mitigation Action Plan
- Discuss Structure of the Plan
- Discuss Next Steps
- Answer Questions

Mr. Stroud discussed each objective and the detail within the Floodplain Mitigation Plan. Several questions were asked against by the committee members and valuable input was received by Mr. Ralph Casals – Cutler Bay's Town Manager. The Power Point presentation lasted approximately 45 minutes.

Janice Rowton made a motion to adjourn the meeting. The motion was seconded by Luis Badillo. The motion to adjourn was agreed based on a voice vote.

Those in attendance included: Ralph Casals, Sandra Cuervo, Alfredo Quintero, David Stroud, Jorge Acevedo, Luis Badillo, Janice Rowton, Paul Mauriello, and Council member Mary Ann Mixon..

The meeting was adjourned at 6:45 PM.

Minutes

Town of Cutler Bay Flood Mitigation Plan Public Meeting

September 25th, 2014

7:00 PM

The Town of Cutler Bay held a public meeting to discuss the "draft" Floodplain Mitigation Plan. This meeting was held in the Cutler Bay Town Council Chambers and began at 7:05 PM.

Mr. David Stroud with AMEC presented details of the final "draft" Floodplain Mitigation Plan.

Mr. Stroud discussed the objectives of the meeting in terms of the review of the final plan which included:

- Describing the planning process
- Review Flood Hazard Problems
- Review Flood Hazard Impacts
- Review Mitigation Action Plan
- Discuss Structure of the Plan
- Discuss Next Steps
- Answer Questions

Mr. Stroud discussed each objective and the detail within the Floodplain Mitigation Plan. The Power Point presentation lasted approximately 30 minutes.

A sign in sheet was provided; however, no one from the public attended this meeting. Members from the Town staff were present.

The meeting was adjourned at 7:35 PM.

Minutes

Town of Cutler Bay Flood Mitigation Plan Public Meeting

October 1, 2014

5:00 PM

The Town of Cutler Bay held a public meeting to discuss the "draft" Floodplain Mitigation Plan. This meeting was held in the Cutler Bay Town Council Chambers and began at 5:10 PM.

Town Manager Ralph Casals provided some opening comments. Council Liaison Mary Ann Mixon thanked the FMPC members and town staff on completing the Floodplain Mitigation Plan. She also discussed the mission statement and goals and objectives of the FMPC

Mr. David Stroud with AMEC presented details of the final "draft" Floodplain Mitigation Plan.

Mr. Stroud discussed the objectives of the meeting in terms of the review of the final plan which included:

- Describing the planning process
- Review Flood Hazard Problems
- Review Flood Hazard Impacts
- Review Mitigation Action Plan
- Discuss Structure of the Plan
- Discuss Next Steps
- Answer Questions

Mr. Stroud discussed each objective and the detail within the Floodplain Mitigation Plan. The Power Point presentation lasted approximately 40 minutes.

A sign in sheet was provided and one member from the public attended this meeting. Members from the Town staff and executive staff along with elected officials were also present.

The meeting was adjourned at 6:15 PM.

FLOOD MITIGATION PLAN WORKSHOP
WEDNESDAY, OCTOBER 01, 2014
SIGN-IN SHEET

Subject Flood Mitigation Plan Workshop **Meeting Date:** October 1, 2014

Facilitator: Town of Cutler Bay **Place/Room:** Town Center Council Chambers

First & Last Name	Phone	E-Mail
YENIER VEGA	3/234-4262	YVEGA@cutlerBAY-FL.GOV
ALFREDO QUINTERO	3/234-4262	AQUINTERO@CUTLERBAY-FL.GOV
Larry Sochin	301-215-561	esochin@bellsouth.net
ED MACDOUGALL	3/302-9418	EMacDougall@CutlerBay-FL.Gov
Ed Wolmers	7/444-3033	Ed.Wolmers@gmail.com
Jacqueline Wilson	3/234-4262	jwilson@cutlerbay-fl.gov
RALPH CASALS	3/234-4262	RCASALS@CUTLERBAY-FL.GOV
MaryAnn Mixon	7/308-1601	mamixon@CutlerBay-fl.gov

Planning Step 2: Involve the Public

Table A-3: Public Meeting Dates

Meeting Type	Meeting Topic	Meeting Date	Meeting Locations
Public Meeting #1	1) Introduction to DMA, CRS and the planning process 2) Overview of BW-12 and NFIP	October 24, 2013	Town Hall
Public Meeting #2	1) Overview of purpose of risk assessment 2) Presentation of risk assessment 3) Presentation of vulnerability assessment	April 23, 2014	Cutler Ridge Park
Public Meeting #3	1) Review "Draft" Floodplain Mitigation Plan 2) Solicit comments and feedback from the public	September 25, 2014	Town Hall
Public Meeting #4	3) Review "Draft" Floodplain Mitigation Plan 4) Solicit comments and feedback from the public	October 1, 2014	Town Council Chambers

Public Meeting – April 23, 2014

Public Meeting – October 1, 2014

Public Meeting Advertisements in Local Newspapers

Miami Herald
Posted on Tue, Oct. 22, 2013

Cutler Bay to hold meeting on rising flood-insurance rates

By Alex Butler
The Miami Herald

Cutler Bay officials are looking for residents' input as they work on a plan to reduce flooding in the town.

The town's anti-flooding efforts come after last year's passage of a new federal law governing flood insurance. The Biggert-Waters Flood Insurance Act aims to reduce government subsidies that now pay part of the cost of flood insurance for many property owners. The law will not immediately affect primary residences, unless the homeowner moves, has a major claim, or changes insurance. Also, according to the Federal Emergency Management Agency, only about 20 percent of properties were subsidized to begin with.

"Homeowners who have lived in their home, are current with their flood insurance and do not let it lapse, will not see an impact," said Sandra Cuervo, building and code compliance manager for the town of Cutler Bay. "But the moment that the homeowner doesn't renew a flood policy and goes to get flood insurance again, they will see the true flood risk."

But owners of vacation or investment homes, business properties with subsidized premiums, and properties with multiple large flood claims will see an increase of 25 percent in premium rates each year until those premiums reflect full-risk rates.

The town had formed a Flood Mitigation Plan Advisory Committee to try and offset the rate hikes by improving drainage.

Now, Cutler Bay property owners get a 20 percent discount based on the town's rating of 6 under the FEMA's Community Rating System, or CRS. If the rating lowers to 5, the new discount would be 25 percent and could be effective by the end of 2014.

"Because of all of the issues with flooding in the area, we were able to qualify for a grant to get a flood mitigation plan," said Sandra Cuervo, building and code compliance manager for the town of Cutler Bay. "We need to figure out what we can do and what areas can be improved to mitigate any potential flood hazards."

The five-member committee, which includes specialists in real estate, public works and insurance, will hold its first public meeting at 6:30 p.m. Thursday, Oct. 24, at Town Hall, 10720 Caribbean Blvd.

More than 268,000 Florida homeowners will see in increase in flood insurance rates as a result of the act. Residents of older homes and residents of non-elevated structures will see the largest impact as they are at a higher level of flood risk.

"We want to analyze and determine what we are doing in CRS and what is going on as far as areas that have more prone to flooding and figure out what can be done and what kind of projects need to be spelled out and what we can do to reduce our flood risk.

"I think there are several goals," Cuervo said. "It will tie in to CRS and try to see if we can improve our rating so that our discount is higher but that is just one component. It's how we can improve what we are doing right now so that we are not exposed. It's about preparing and being able to plan short- and long-term for any flooding event."

Floodplain Mitigation Plan Workshop is October 1

Michael Miller
EXECUTIVE EDITOR
AROUND TOWN

Concerned about flood insurance rates? We hear from the office of Sandra Cuervo, CFM Building & Code Compliance Division Manager of the Town of Cutler Bay's Department of Community Development, that a Floodplain Mitigation Plan Workshop is scheduled for Wednesday October 1 in the Town Hall Council Chambers at 5:00 p.m. Residents are invited to attend.

The town has been working on a flood mitigation plan for some months now with the hopes of reducing the flood insurance rates of residents in Cutler Bay. A committee comprised of town residents and business owners with expertise in real estate, water management, flood insurance, construction and other areas was formed and the committee members have attended six meetings thus far with AMEC, the town consultant for the project, members of the town staff and town liaison Council Member Mary Ann Mixon.

The idea is that by identifying, assessing and mitigating flood risk in the town, and coming up with safety measures that will reduce hazards during storm and other disaster caused flooding, there may be savings in insurance costs. The most recent meeting took place on Thursday, September 25.

Council Member Mary Ann Mixon (right side) and members of the Floodplain Mitigation Advisory Committee discuss the proposed Flood Mitigation Plan.

For those interested in attending the October 1 workshop, Town Hall is located at 10720 Caribbean Blvd. Suite 220 in Cutler Bay. For more information, please contact Sandra Cuervo at 305-234-4262 or visit the town's website at <www.cutlerbay-fl.gov>.

And by the way… Speaking of Town Hall, which is in the Cutler Bay Town Center there at 10720 Caribbean Boulevard, they still have some office space for lease in that big multistory building there behind Southland Mall. If you're interested you can find the details at <www.cutlerbaytowncenter.com>.

New restaurant… Miami Grill, which is a re-branding of the original Miami Subs, opened in Cutler Bay the beginning of September with a crowd of folks eager to get their favorite sandwiches, gyros and seasoned fries again. It's located at 118660 South Dixie Highway, on the west side of the street. Call them at 305-251-5816.

Don't miss this! The Cutler Ridge Woman's Club is having their Autumn Bunco Party on October 11th at 10:00 a.m., with lunch at noon. This is their charitable fundraiser, with door prizes, an auction table, bake sale, books, a treasure table and more. The cost is $17. Location is at Cutler Ridge Park, 10100 SW 200 Street. For reservations or questions please call Carol Ponzini at 305-233-3965.

Thought of the Day:

If we were meant to talk more than listen, we would have two mouths and one ear.
— Mark Twain

Gary Alan Ruse contributed to this column.

Got any tips? Contact me at 305-669-7355, ext. 249, or send emails to <Michael@communitynewspapers.com>.

The Town of Cutler Bay distributed a public survey written in both English and Spanish that requested public input into the flood mitigation plan planning process and the identification of mitigation activities that could lessen the risk and impact of future flood hazard events. The survey was provided on the Town website as well as distributed at community events as detailed in Section 2.

The Town received 73 completed surveys. The following is a summary of <u>combined</u> survey responses received either via hard copy at community events or through the Town's website.

Q1: Where do you live?

Answered: 59 Skipped: 14

Answer Choices	Percentage	Number Responding
Cutler Bay	100.0	59
Other	0.00	0
Total	**100.0**	**59**

Q2: Have you ever experienced or been impacted by high water or flooding in Cutler Bay?

Answered: 73 Skipped: 0

Answer Choices	Percentage	Number Responding
Yes	50.7	37
No	49.3	36
Total	**100.0**	**73**

Q3: How concerned are you about the possibility of your community being impacted by flooding?

Answered: 69 Skipped: 4

Answer Choices	Percentage	Number Responding
Extremely concerned	33.3	23
Somewhat concerned	42.0	29
Not concerned	24.6	17
Total	**99.9**	**69**

Q4: Is your home located in a Federal Emergency Management Agency (FEMA) floodplain?

Answered: 67 Skipped: 6

Answer Choices	Percentage	Number Responding
Yes	50.7	34
No	23.9	16
I don't know	25.4	17
Total	**100.0**	**67**

Q5: Do you have flood insurance for your home/personal property?

Answered: 68 Skipped: 5

Answer Choices	Percentage	Number Responding
Yes	67.6	46
No	30.9	21
I don't know	1.5	1
Total	**100.0**	**68**

Q6: If "no" to previous question, why not?

Answered: 24 Skipped: 52

Answer Choices	Percentage	Number Responding
My home is not located in a floodplain	33.3	8
I rent	16.7	4
It's too expensive	16.7	4
I don't need it because it never floods	8.3	2
I don't need it because my home is elevated or otherwise protected	12.5	3
I never really considered it	0	0
Other	12.5	3
Total	**100.0**	**24**

Q7: Have you taken any actions to protect your home from flood damage?

Answered: 68 Skipped: 5

Answer Choices	Percentage	Number Responding
Yes	17.6	12
No	82.4	56
Total	**100.0**	**68**

Q8: Do you know what government agency/office to contact regarding the risks associated with flooding?

Answered: 70 Skipped: 3

Answer Choices	Percentage	Number Responding
Yes	44.3	31
No	55.7	39
Total	**100.0**	**70**

Q9: What is the most effective way for you to receive information about how to make your home or neighborhood more resistant to flood damage?

Answered: 70 Skipped: 3

Answer Choices	Percentage	Number Responding
Newspaper	17.1	12
Television advertising or programs	20.0	14
Radio advertising or programs	2.9	2
Internet	27.1	19
Email	45.7	32
Mail	42.9	30
Public workshops/meetings	11.4	8
School meetings	2.9	2
Other	0	0
Total	**170.0***	**119***

*Note: Respondents were able to choose more than one answer choice

Q10: In your opinion, what are some steps your local government could take to reduce the risk of flooding in your neighborhood?

Below is a sample of responses received to Question 10

"Place larger pipes to redirect water that fills in certain neighborhoods which are clearly shown in the FEMA flood zone chart for Cutler Bay. Also, put more water holding drain tanks along the path of where the water will finally settle. This will elevate the amount of water that settles in its final destination above ground, and more periodic removal of water from the drains that are already in place."

"Better storm drainage. There are limited storm drains located throughout the area; they are clogged, not maintained..."

"Improve drainage in low lying areas. Also, pinpoint the specific areas in Cutler Bay that are prone to flooding and create a way of educating those citizens in prevention and preparation in the event of a flood."

"1) Have emergency plan and supplies (i.e. pumps) 2) Have resident emergency supplies available (i.e. Sandbags) 3) Continue to improve drainage management and infrastructure 4) Have plan to direct traffic from flooded areas (I've seen many stalled cars on roadways that should have been blocked off and re-directed) 5) Establish communication link with residents for warning and updates."

"Restore natural areas to absorb flooding. Keep gullies free of debris."

"Draining in this neighborhood is inadequate and needs updating."

"Survey for known flood-prone streets and intersections, and then provide adequate drains…"

"Plant more trees and shrubs."

"Make sure all drains are clean and working. Improve drainage in areas that flood."

"Provide information on how to reduce risk of flooding."

"Install more efficient drainage systems."

"Better planning and educate the public on climate change."

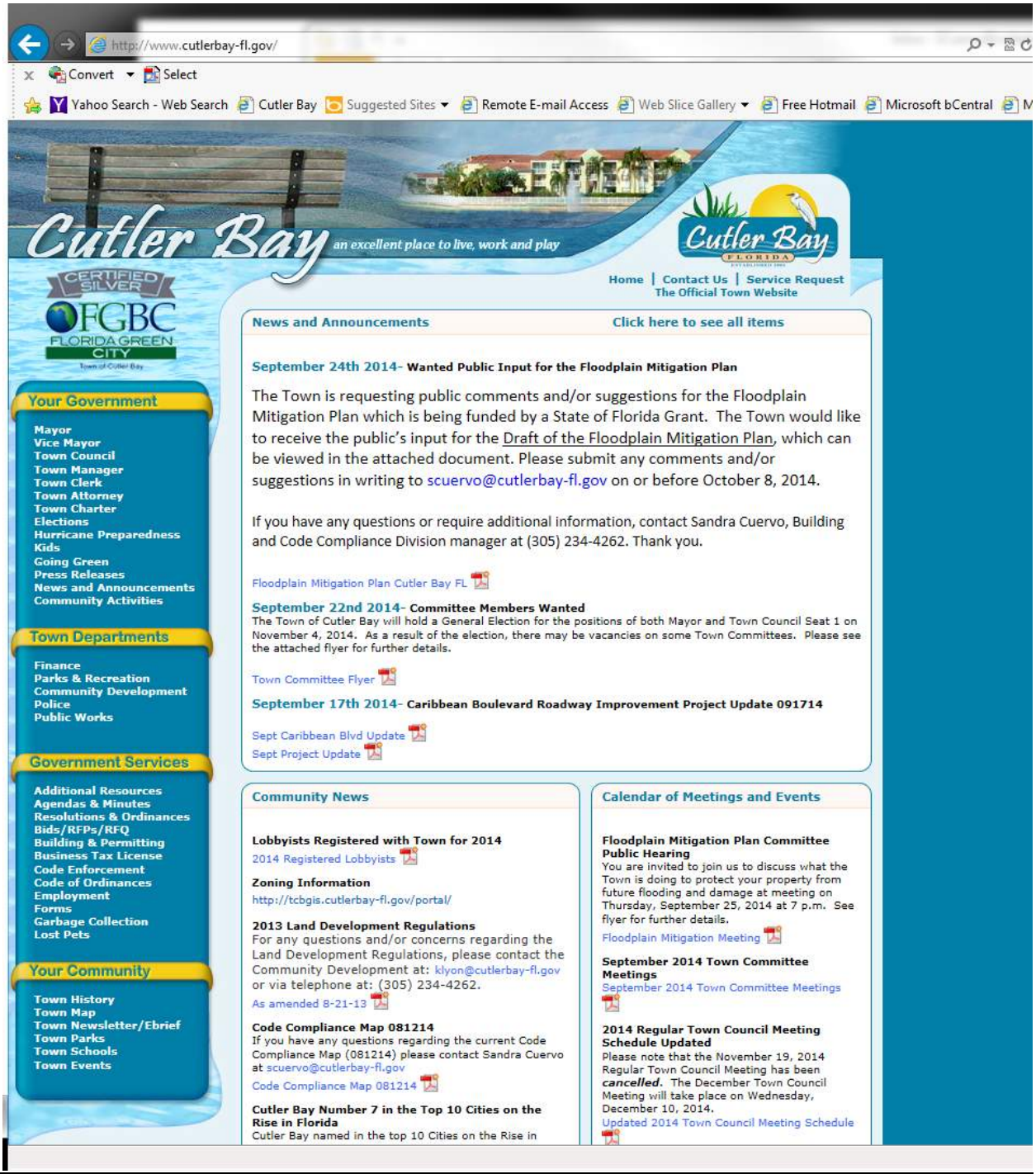
"Construct new homes at higher elevations."

The Town of Cutler Bay posted the Draft Risk Assessment for public review and comment on the Town's website.

June 19, 2014 Posting

The Town of Cutler Bay posted the entire Draft Floodplain Mitigation Plan for public review and comment on the Town's website.

September 24, 2014 Posting



Planning Step 3: Coordinate

This planning step credits the incorporation of other plans and other agencies' efforts into the development of the floodplain mitigation plan. Other agencies and organizations must be contacted to determine if they have studies, plans and information pertinent to the floodplain management plan, to determine if their programs or initiatives may affect the community's program, and to see if they could support the community's efforts. Coordination efforts with other agencies are documented in the invitation letters below.

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Joy Duperault, CFM
NFIP Program Manager
Florida Division of Emergency Management
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Ms. Duperault:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

Our objective in reaching out to other agencies and stakeholders is to coordinate with those who may bring additional information to the planning process and associated flood issues within Cutler Bay. Any information, studies, etc. which may supplement the work of the established Floodplain Mitigation Technical Advisory Committee would be welcomed. Additionally, we invite your participation at our committee and public meetings throughout the planning process. Dates for future meeting are posted on the Town's website: www.CUTLERBAY-FL.GOV.

Ms. Sandra Cuervo, Building & Code Compliance Division Manager, is the program manager for this project. She can be reached at (305) 234-4264 or scuervo@cutlebay-FL.gov or you may send information directly to Sandra's attention to the address on this letterhead. Additionally you can contact our planning consultant, David Stroud with AMEC at (919) 765-9986 or david.stroud@amec.com.

We look forward to hearing from you and/or participation at future committee and public meetings.

Regards,

Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Miles Anderson
State Hazard Mitigation Officer &
NFIP Coordinator
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Anderson:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

Our objective in reaching out to other agencies and stakeholders is to coordinate with those who may bring additional information to the planning process and associated flood issues within Cutler Bay. Any information, studies, etc. which may supplement the work of the established Floodplain Mitigation Technical Advisory Committee would be welcomed. Additionally, we invite your participation at our committee and public meetings throughout the planning process. Dates for future meeting are posted on the Town's website: www.CUTLERBAY-FL.GOV.

Ms. Sandra Cuervo, Building & Code Compliance Division Manager, is the program manager for this project. She can be reached at (305) 234-4264 or scuervo@cutlebay-FL.gov or you may send information directly to Sandra's attention to the address on this letterhead. Additionally you can contact our planning consultant, David Stroud with AMEC at (919) 765-9986 or david.stroud@amec.com.

We look forward to hearing from you and/or participation at future committee and public meetings.

Regards,

Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Danny Hinson, CFM, FPEM, CHS-III
Florida Community Rating System Coordinator
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Hinson:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

Our objective in reaching out to other agencies and stakeholders is to coordinate with those who may bring additional information to the planning process and associated flood issues within Cutler Bay. Any information, studies, etc. which may supplement the work of the established Floodplain Mitigation Technical Advisory Committee would be welcomed. Additionally, we invite your participation at our committee and public meetings throughout the planning process. Dates for future meeting are posted on the Town's website: www.CUTLERBAY-FL.GOV.

Ms. Sandra Cuervo, Building & Code Compliance Division Manager, is the program manager for this project. She can be reached at (305) 234-4264 or scuervo@cutlebay-FL.gov or you may send information directly to Sandra's attention to the address on this letterhead. Additionally you can contact our planning consultant, David Stroud with AMEC at (919) 765-9986 or david.stroud@amec.com.

We look forward to hearing from you and/or participation at future committee and public meetings.

Regards,

Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Sherry Harper, AICP, CFM
Planning Technical Coordinator ISO
Community Hazard Mitigation
2382 Susan Drive
Crestview, FL 32536

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Ms. Harper:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

Our objective in reaching out to other agencies and stakeholders is to coordinate with those who may bring additional information to the planning process and associated flood issues within Cutler Bay. Any information, studies, etc. which may supplement the work of the established Floodplain Mitigation Technical Advisory Committee would be welcomed. Additionally, we invite your participation at our committee and public meetings throughout the planning process. Dates for future meeting are posted on the Town's website: www.CUTLERBAY-FL.GOV.

Ms. Sandra Cuervo, Building & Code Compliance Division Manager, is the program manager for this project. She can be reached at (305) 234-4264 or scuervo@cutlebay-FL.gov or you may send information directly to Sandra's attention to the address on this letterhead. Additionally you can contact our planning consultant, David Stroud with AMEC at (919) 765-9986 or david.stroud@amec.com.

We look forward to hearing from you and/or participation at future committee and public meetings.

Regards,

Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Heidi Liles, CFM
ISO/CRS Specialist
284 Sabal Palm Place
Longwood, FL 32779

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Ms. Liles:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

Our objective in reaching out to other agencies and stakeholders is to coordinate with those who may bring additional information to the planning process and associated flood issues within Cutler Bay. Any information, studies, etc. which may supplement the work of the established Floodplain Mitigation Technical Advisory Committee would be welcomed. Additionally, we invite your participation at our committee and public meetings throughout the planning process. Dates for future meeting are posted on the Town's website: www.CUTLERBAY-FL.GOV.

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We look forward to hearing from you and/or participation at future committee and public meetings.

Regards,

Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Susan Wilson, CFM
Floodplain Management and
Insurance Branch Chief
FEMA Region IV
3303 Chamblee Tucker Road
Atlanta, GA 30341

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Ms. Wilson:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Janice Mitchell
CRS Coordinator
FEMA Region IV
3303 Chamblee Tucker Road
Atlanta, GA 30341

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Ms. Mitchell:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Jason Hunter
NFIP - FEMA Region IV
3303 Chamblee Tucker Road
Atlanta, GA 30341

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Hunter:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Regards,

Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Yocelyn Galiano Gomez
Village Manager
Village of Pinecrest
12645 Pinecrest Parkway
Pinecrest, FL 33156

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Ms. Gomez:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Regards,

Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

The Honorable Jeff Porter
Mayor of Homestead
650 NE 22 Terrace
Homestead, FL 33033

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mayor Porter:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Regards,

Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Patrick Salerno
City Manager
City of Coral Gables
405 Biltmore Way
Coral Gables, FL 33134

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Salerno:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Regards,

Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Ron E. Lewis
Village Manager
Village of Palmetto Bay
9705 East Hibiscus Street
Palmetto Bay, FL 33157

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Lewis:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Regards,

Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Lee Hefty
Miami-Dade County Regulatory and Economic Development Agency
Environmental Resources Management Department
Overtown Transit North
701 NW 1st Court
Miami, FL 33136

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Hefty:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Regards,

Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Jack Osterholt
Director
Miami-Dade County Regulatory and
Economic Resources Department
Stephen P. Clark Center
111 NW 1st Street
Miami, FL 33128

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Osterholt:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Armando Vilboy
Intergovernmental & Outreach Representative
South Florida Water Management District
9001 NW 58th Street
Miami, FL 33178

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Vilboy:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Regards,

Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Sandy Batchelor
Governing Board Member, SFWMD
9001 NW 58th Street
Miami, FL 33178

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Ms. Batchelor:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Juan M. Portuondo
Governing Board Member, SFWMD
9001 NW 58th Street
Miami, FL 33178

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Portuondo:

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Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Timothy Sargent
At Large Appointee Governing Board, SFWMD
9001 NW 58th Street
Miami, FL 33178

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Sargent:

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Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Kevin Powers
Vice Chair and At Large Appointee
Governing Board, SFWMD
9001 NW 58th Street
Miami, FL 33178

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Powers:

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Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Carlos Castillo
South Florida Region of
the American Red Cross
6710 West Sunrise Blvd., #111
Plantation, FL 33313

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Castillo:

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Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Rusty Pfost
Meteorologist in Charge
Miami Field Office
National Weather Service
11691 SW 17th Street
Miami, FL 33165

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Pfost:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Cathie Perkins
LMS Coordinator-Planner
Miami-Dade Emergency Management
9300 NW 41st Street
Miami, FL 33178

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Ms. Perkins:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

US Army Corp of Engineers
Miami Resident Office
3300 SW 148th Avenue
Miramar, FL 33027

RE: Town of Cutler Bay Flood Mitigation Plan

To Whom It May Concern:

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Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Alberto M. Carvalho
Superintendent
Miami-Dade Public Schools
1450 NE 2nd Avenue, Suite 912
Miami, FL 33132

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Carvalho:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

Our objective in reaching out to other agencies and stakeholders is to coordinate with those who may bring additional information to the planning process and associated flood issues within Cutler Bay. Any information, studies, etc. which may supplement the work of the established Floodplain Mitigation Technical Advisory Committee would be welcomed. Additionally, we invite your participation at our committee and public meetings throughout the planning process. Dates for future meeting are posted on the Town's website: www.CUTLERBAY-FL.GOV.

Ms. Sandra Cuervo, Building & Code Compliance Division Manager, is the program manager for this project. She can be reached at (305) 234-4264 or scuervo@cutlebay-FL.gov or you may send information directly to Sandra's attention to the address on this letterhead. Additionally you can contact our planning consultant, David Stroud with AMEC at (919) 765-9986 or david.stroud@amec.com.

We look forward to hearing from you and/or participation at future committee and public meetings.

Regards,

Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

The Honorable Carlos A. Gimenez
Mayor of Miami-Dade
Stephen P. Clark Center
111 NW 1st Street
Miami, FL 33128

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mayor Gimenez:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Regards,

Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Matt Johnson
Public Information Officer
Key Biscayne National Park
9700 SW 328th Street
Homestead, FL 33033

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Johnson:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Regards,

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Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Fortis College
Cutler Bay Campus
19600 S. Dixie Highway
Cutler Bay, FL 33157

RE: Town of Cutler Bay Flood Mitigation Plan

To Whom It May Concern:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

CBT College
Cutler Bay Campus
19151 S. Dixie Highway
Cutler Bay, FL 33157

RE: Town of Cutler Bay Flood Mitigation Plan

To Whom It May Concern:

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Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Paul Souza
US Fish and Wildlife Service
SE Florida Ecological Field Office
1339 20th Street
Vero Beach, FL 32960

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Souza:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Tyree Davis
Information Resource
Management Director
NOAA SE Fisheries Science Ctr
75 Virginia Beach Drive
Miami, FL 33149

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Davis:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Regards,

Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Susan Mason
Program Manager
FL DEP – Southeast District
400 North Congress Ave., 3rd FL
West Palm Beach, FL 33401

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Ms. Mason:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Regards,

Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Alina Hudak
Interim Director
Public Works and Waste Management
Stephen P. Clark Center
111 NW 1st Street
Miami, FL 33128

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Ms. Hudak:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Regards,

Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

Gus Pego
Florida Department of Transportation
District 6 Office
1000 NW 111th Avenue
Miami, FL 33172

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Pego:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Rafael G. Casals
Town Manager

Office of the Town Manager

Rafael G. Casals, CFM
Town Manager

January 27th, 2014

James F. Murley
Executive Director
South Florida Regional Planning Council
3440 Hollywood Bld., Suite 140
Hollywood, FL 33021

RE: Town of Cutler Bay Flood Mitigation Plan

Dear Mr. Murley:

The Town of Cutler Bay is developing a flood mitigation plan to address the flood hazards and associated stormwater and local drainage issues that impact the community. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000, as well as the 10-steps of Activity 510-Floodplain Management Planning in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program.

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Rafael G. Casals
Town Manager

Appendix B

Appendix B: Mitigation Strategy

Hazard Identification & Profiles

Table B.1 Hazard Summary for the Town of Cutler Bay

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Climate Change and Sea Level Rise	Occasional	Limited	Limited	Low
Coastal/Canal Bank Erosion	Likely	Limited	Limited	Low
Dam/Levee Failure	Unlikely	Limited	Negligible	Low
Flood: 100-/500-year	Likely	Extensive	Catastrophic	High
Flood: Stormwater/Localized Flooding	Highly Likely	Significant	Limited	Medium
Hurricane and Tropical Storms (including Storm Surge)	Likely	Extensive	Catastrophic	High

Guidelines:
Frequency of Occurrence:
Highly Likely: Nearly 100% probability within the next year.
Likely: Between 10 and 100% probability within the next year.
Occasional: Between 1 and 10% probability within the next year.
Unlikely: Less than 1% probability within the next year.

Potential Magnitude:
Catastrophic: More than 50% of the area affected.
Critical: 25 to 50% of the area affected.
Limited: 10 to 25% of the area affected.
Negligible: Less than 10% of the area affected.

Spatial Extent:
Limited: Less than 10% of planning area.
Significant: 10-50% of planning area.
Extensive: 50-100% of planning area.

Significance:
Low
Medium
High

B.1 Risk Assessment Methodology

B.1.1 Calculating Likelihood of Future Occurrence

The frequency of past events is used in this section to gauge the likelihood of future occurrences. Based on historical data, the likelihood of future occurrence is categorized into one of the following classifications:

Highly Likely: Near 100% chance of occurrence in next year, or happens every year.

Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.

Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.

Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

B.1.2 Calculating Vulnerability

Vulnerability is measured in general, qualitative terms, and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential:

Extremely Low: The occurrence and potential cost of damage to life and property is very minimal to non-existent.

Low: Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.

Medium: Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.

High: Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have already occurred in the past.

Extremely High: Very widespread and catastrophic impact.

B.1.3 Defining Significance (Priority) of a Hazard

Defining the significance or priority of a hazard to a community is based on a subjective analysis of several factors. This analysis is used to focus and prioritize hazards and associated mitigation measures for the plan. These factors include the following:

Past Occurrences: Frequency, extent, and magnitude of historic hazard events.

Likelihood of Future Occurrences: Based on past hazard events.

Ability to Reduce Losses through Implementation of Mitigation Measures: This looks at both the ability to mitigate the risk of future occurrences as well as the ability to mitigate the vulnerability of a community to a given hazard event. It also considers the extent to which existing mitigation measures are in place to adequately address the hazard.

B.1.4 Town of Cutler Bay Hazard ID/Vulnerability/Priority Summary

Climate Change and Sea Level Rise

- Data shows climate change and seal level rise issues are affecting the Cutler Bay planning area.
- LOFO: Occasional
- Vulnerability: Low
- Priority Hazard

Coastal/Canal Bank Erosion

- Data shows coastal erosion is a problem in areas adjacent to the Cutler Bay planning area, but not within Cutler Bay itself. There are known local instances of canal bank erosion.
- LOFO: Likely
- Vulnerability: Low
- Priority Hazard

Dam/Levee Failure

- 38 dams are located within Miami-Dade County; no dams are located within Cutler Bay.
- The L-31 East levee is located within Cutler Bay.
- There are no recorded dam breaches or levee failures within Miami-Dade County.
- LOFO: Unlikely
- Vulnerability: Low
- Non-Priority Hazard

Flood: 100-/500-year

- Extensive 100-yr floodplain coverage within Cutler Bay
- 50 flooding records for Miami-Dade County in NCDC; 24 flooding records for Miami-Dade County in SHEDLUS
- LOFO: Likely
- Vulnerability: High
- Priority Hazard

Flood: Stormwater/Localized Flooding

- Localized flooding also occurs at various times throughout the year with several areas of primary concern to the Town. Localized flooding and ponding affect streets and property.
- LOFO: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Hurricane and Tropical Storm (including Storm Surge)

- 5 Hurricane Disaster Declarations for Miami-Dade County (1960-2014)
- NCDC reports 31 hurricane and tropical storm occurrences for Miami-Dade County over a period of 16 years (1996- 2012)
- NCDC reports 5 records for coastal storm surge over a period of seven years (2005-2012)
- LOFO: Likely – Hurricane; Likely – Storm Surge
- Vulnerability: High
- Priority Hazard

B.1.5 Town of Cutler Bay Priority Hazards

Priority Hazards

- Climate Change and Sea Level Rise
- Coastal/Canal Bank Erosion
- Flood: 100/500 year
- Flood: Stormwater/ Localized Flooding
- Hurricane and Tropical Storms (including Storm Surge)

Non-Priority Hazards

- Dam/Levee Failure

B. 2 Mitigation Goals Development

B.2.1 Formulating Mitigation Goals

The FMPC collected and provided data for the Town of Cutler Bay Floodplain Mitigation Plan. From this information, a Risk Assessment was developed that describes the risk and vulnerability of the Town to identified hazards and includes an assessment of the area's current capabilities for countering these threats through existing policies, regulations, programs, and projects.

This analysis identifies areas where improvements could or should be made. Formulating Goals leads to incorporating these improvements into the Mitigation Strategy portion of the plan. The planning goals should provide direction for what should be done to make the planning area more disaster resistant.

GOALS: Goals are stated without regard for implementation, that is, implementation cost, schedule, and means are not considered. Goals are defined before considering how to accomplish them so that the goals are not dependent on the means of achievement. Goals are public policy statements that:

- Represent basic desires of the jurisdiction;
- Encompass all aspects of planning area, public and private;
- Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;
- Are future-oriented, in that they are achievable in the future; and
- Are time-independent, in that they are not scheduled events.

B.2.2 Goal Development

The Cutler Bay FMPC conducted an exercise to outline its goals for this flood mitigation plan. The goal setting exercise is covered in detail in Section 4. At the end of the exercise, the FMPC agreed upon four general goals for this planning effort. The goals were refined and include:

Goal 1: Protect the health, safety and welfare of the citizens of Cutler Bay from the effects of flooding

Goal 2: Promote a public education program to encourage residents to undertake mitigation measures that reduce the effects of flood damage on private property

Goal 3: Protect critical and essential facilities from flood damage

Goal 4: Reduce the number of repetitively flooded structures

The FMPC also included objectives in support of the goals. The FMPC developed ten objectives in for implementing each goal. The objective numbers relate to the goal numbers above. The objectives include:

Objective 1.1: Reduce flood damage to insurable buildings and public infrastructure through stormwater improvement projects

Objective 1.2: Preserve open space areas, especially where there are sensitive natural areas

Objective 1.3: Promote higher development and design standards to protect new buildings from flood damage

Objective 2.1: Encourage residents to assume an appropriate level of responsibility for their own flood protection

Objective 2.2: Promote flood insurance as a property protection measure against potential flood damage

Objective 2.3: Develop a public education program for the local schools

Objective 3.1: Seek county, state and federal support for mitigation projects

Objective 3.2: Prioritize critical and essential facilities in need of protection from potential flood damage

Objective 4.1: Leverage local, state and federal grant funding to facilitate mitigation actions such as elevation, acquisition, or floodproofing

Objective 4.2: Target repetitive loss properties for implementation of mitigation projects

B.3 Categories of Mitigation Measures Considered

The following categories are based on the Community Rating System.

- Prevention
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information

B.4 Alternative Mitigation Measures per Category

Note: the CRS Credit Sections are based on the 2013 CRS Coordinator's Manual.

B.4.1 Preventative and Regulatory Measures

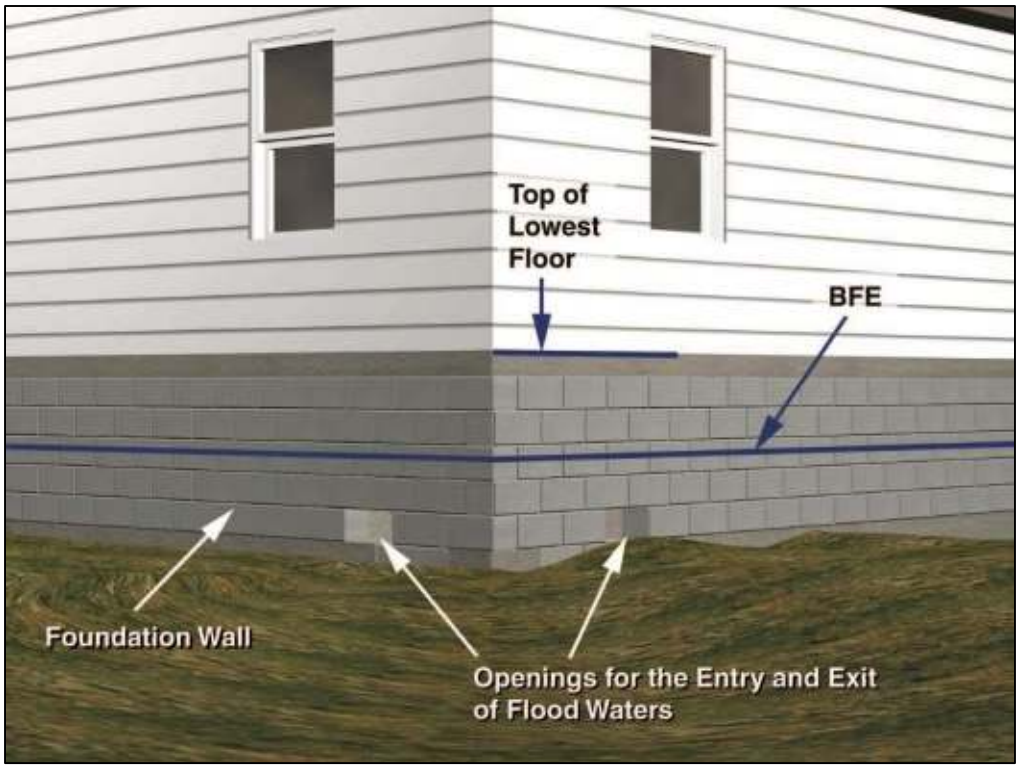
Preventive measures are designed to keep a problem - such as flooding - from occurring or from getting worse. The objective of preventive measures is to ensure that future development is not exposed to damage and does not cause an increase in damages to other properties. Building, zoning, planning and code enforcement offices usually administer preventive measures. Some examples of types of preventive measures include:

- Building codes
- Planning and zoning
- Open space preservation
- Floodplain regulations
- Stormwater management

Building Codes

Building codes provide one of the best methods of 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, 2000*

Figure B.1 – Building Codes and Flood Elevations

Local Implementation

The Town of Cutler Bay has adopted the *2010 Florida Building Code*. Cutler Bay has a 1 foot freeboard requirement and might consider adding an additional foot of freeboard.

Reducing Future Flood Losses

Future flood losses in the Town of Cutler Bay will be reduced through the implementation of the 2010 Florida Building Code with the sloping requirement of grade away from buildings. Further implementation of a 1 foot freeboard requirement will provide an extra level of protection to buildings constructed in the Town.

CRS Credit

The CRS encourages strong building codes. It provides credit in two ways: points are awarded based on the community's Building Code Effectiveness Grading Schedule (BCEGS) classification and points are awarded for adopting the International Code series. Cutler Bay's BCEGS rating is a Class 4 for both residential and commercial. The Town of Cutler Bay has adopted the *2010 Florida Building Code* which is based on national model building codes and national consensus standards which are amended where necessary for Florida's specific needs. The Florida Building Code is updated every three years. Cutler Bay currently receives credit for Activity 430 – Higher Regulatory Standards.

Planning and Zoning

Building codes provide guidance on how to build in hazardous areas. Planning and zoning activities direct development away from these areas, particularly floodplains and wetlands. They do this by designating land uses that are compatible with the natural conditions of land that is prone to flooding, such as open space or recreation. Planning and zoning activities can also provide benefits by simply allowing developers more flexibility in arranging improvements on a parcel of land through the planned development approach.

Local Implementation

Comprehensive Plan

The Town of Cutler Bay Comprehensive Growth Management Plan was adopted in April 2008. A Comprehensive Plan, in broad terms, is a policy statement to guide the future placement and development of community facilities. It is the basis for a community's zoning, subdivision and design regulations and a community's official maps and amendments to the zoning, subdivision and design ordinances. The future land use element of the plan represent's the Town's vision for its development and redevelopment during the five, 10 and 15 year planning periods. The future land use maps and districts will serve as the foundation for subsequent development of more detailed Land Development Regulations and special area plans. These regulations and plans must be consistent with and further the implementation of the future land use element of the Comprehensive Growth Management Plan and its goals, objectives and policies in accordance with the Town's master planning document.

Zoning and Subdivision Regulations

The Town of Cutler Bay's Land Development Regulations were adopted in June 2012. The purpose of the Town's Land Development Regulations is to provide the minimum regulations necessary to facilitate safe and orderly growth, and to also ensure that growth forms an integral part of a community of functional neighborhoods, retail and commercial centers; increases collective security and community identity to promote civic awareness and responsibility; and enhances the quality of life for the entire Town to ensure the greatest possible economic and social benefits for all residents. These regulations are intended to promote consistency with the goals, objectives and policies of the Town's Growth Management Plan.

Capital Improvement Plan

The Town of Cutler Bay Stormwater Master Plan identified 17 priority sub-basins that were ranked from worst to best according to current performance against established Plan goals. The Capital Improvement Program is based on the results of the 17 priority sub-basin studies. Recommended improvements to achieve the stated performance goals were identified for each basin, and a ten-year CIP summary (2008-2018) including preliminary budgets has been prepared for each basin.

Reducing Future Flood Losses

Zoning and comprehensive planning can work together to reduce future flood losses by directing development away from hazard prone areas. The Town of Cutler Bay has a large wetland or natural area on the east side of town which is designated as "conservation" under the Town's Growth Management Plan.

Open Space Preservation

Keeping the floodplain and other hazardous areas open and free from development is the best approach to preventing damage to new developments. Open space can be maintained in agricultural use or can serve as parks, greenway corridors and golf courses.

Comprehensive and capital improvement plans should identify areas to be preserved by acquisition and other means, such as purchasing an easement. With an easement, the owner is free to develop and use private property, but property taxes are reduced or a payment is made to the owner if the owner agrees to not build on the part set aside in the easement.

Although there are some federal programs that can help acquire or reserve open lands, open space lands and easements do not always have to be purchased. Developers can be encouraged to dedicate park land and required to dedicate easements for drainage and maintenance purposes. These are usually linear areas along property lines or channels. Maintenance easements also can be donated by streamside property owners in return for a community maintenance program.

Reducing Future Flood Losses

Creating or maintaining open space is the primary way to reduce future flood losses. The Town of Cutler Bay has many open space and natural parcels which serve to reduce future flood losses by remaining open. These parks and natural preserved areas create opportunities for the public to benefit from education and recreation while eliminating potential for future flooding.

Local Implementation

The Town currently preserves approximately 1,904 acres in the SFHA as open space. Credit is also provided for open space that is deed restricted and preserved in a natural state.

CRS Credit

Cutler Bay currently receives credit for Activity 420 – Open Space Preservation. Preserving flood prone areas as open space is one of the highest priorities of the Community Rating System. The credits in the 2013 manual have doubled for OSP (Open Space Preservation). Credit is based on the area of the floodplain that is designated as public undeveloped properties, parks, wildlife refuges, golf courses, or other uses that can be kept vacant through ownership or regulations.

Floodplain Regulations

The National Flood Insurance Program (NFIP) is administered by the Federal Emergency Management Agency (FEMA). As a condition of making flood insurance available for their residents, communities that participate in the NFIP agree to regulate new construction in the area subject to inundation by the 100-year (base) flood. The floodplain subject to these requirements is shown as an A or V Zone on the Flood Insurance Rate Map (FIRM).

Reducing Future Flood Losses

The following regulatory requirements help Cutler Bay reduce future flood losses especially through freeboard and requiring regulatory permitting for floodplain construction. Additional higher standards can also help prevent future flood losses in Cutler Bay.

There are five major floodplain regulatory requirements. Additional floodplain regulatory requirements may be set by state and local laws.

1) All development in the 100-year floodplain must have a permit from the community. The NFIP regulations define "development" as any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.

2) Development along a river or other channel cannot obstruct flows so as to cause an increase in flooding on other properties. An analysis must be conducted to demonstrate that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.

3) New buildings may be built in the floodplain, but they must be protected from damage from the base flood. In riverine floodplains, the lowest floor of residential buildings must be elevated to be at or above the base flood elevation (BFE). Nonresidential buildings must be either elevated or floodproofed.

4) Under the NFIP, a "substantially improved" building is treated as a new building. The NFIP regulations define "substantial improvement" as any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the start of construction of the improvement. This requirement also applies to buildings that are substantially damaged.

5) Communities are encouraged to adopt local ordinances that are more comprehensive or provide more protection than the federal criteria. The NFIP's Community Rating System provides insurance premium credits to recognize the additional flood protection benefit of higher regulatory standards.

Local Implementation

The Town of Cutler Bay has many higher standards in place including 1 foot of Freeboard and may consider other options for additional higher standards for its 2015 Cycle Visit.

Manufactured Homes

Manufactured or mobile homes are usually not regulated by local building codes. They are typically built in a factory in another state and are shipped to a site. They do have to meet construction standards set by the U.S. Department of Housing and Urban Development. All mobile homes constructed after 1976 must comply with HUD's National Manufactured Home Construction and Safety Standards. These standards apply uniformly across the country and it is illegal for a local unit of government to require additional construction requirements. Local jurisdictions may regulate the location of these structures and their on-site installation.

The NFIP allows communities to exempt mobile homes in existing mobile home parks from some of the flood protection requirements. Cutler Bay‘s Floodplain Management Ordinance requires the following for manufactured homes:

a. All manufactured homes that are placed, or substantially improved with Zones A1-30, AH, and AE, on sites (i) outside of an existing manufactured home park or subdivision, (ii) in a new manufactured home park or subdivision, (iii) in an expansion to an existing manufactured home park of subdivision, or (iv) in an existing manufactured home park or subdivision on which a manufactured home has incurred “substantial damage” as the result of a flood, the lowest flood be elevated on a permanent foundation to no lower than one foot above the base flood elevation,

beginning March 1, 2009, and be securely anchored to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.

b. All manufactured homes to be placed or substantially improved in an existing manufactured home park or subdivision within Zones A-1, AH, and AE, that are not subject to the provisions of paragraph (a) above, must be elevation so that either:
    i. The lowest floor of the manufactured home is elevated to no lower than one foot above the base flood elevation, or
    ii. The manufactured home chassis is supported by reinforced piers or other foundation elements of at least an equivalent strength that are no less than 48 inches in height above the grade and securely anchored to an adequate foundation system to resist flotation, collapse and lateral movement.
c. Placement of manufactured homes is prohibited within the regulatory floodway, except in an existing manufactured home park or subdivision.

There are additional requirements for recreational vehicles.

Residential Construction (Reduce Future Flood Losses - Regulatory)
The Town's Floodplain Management Ordinance requires that all new residential construction or substantial improvement shall have the lowest floor, including the basement, elevated to no lower than one foot above the base flood elevation. Should solid foundation perimeter walls be used to elevate a structure, openings sufficient to facilitate automatic equalization of flood hydrostatic forces on both sides of the exterior walls shall be provided.

Non-Residential Construction (Reduce Future Flood Losses- Regulatory)
For non-residential new construction or substantial improvement, the Town's Code requires that the lowest floor, including the basement, be elevated to no lower than one foot above the base flood elevation. All buildings located in A-Zones may be flood-proofed, in lieu of being elevated, provided that all areas of the building components below the base flood elevation plus one foot are water tight with walls substantially impermeable to the passage of water, and use structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy.

Reduce Future Flood Losses
In addition to residential construction, non-residential construction and substantial improvements, all standards shall be:

- Designed or modified and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy
- Constructed in ways that minimize flood damage
- Constructed with materials resistant to flood damage
- Constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities, designated or located so as to prevent water from entering or accumulating within components during flooding

CRS Credit
Cutler Bay currently receives credit for Activity 430 – Higher Regulatory Standards. The Town receives credit for enforcing regulations that require freeboard for new and substantial improvement construction, cumulative substantial improvement, lower substantial improvement, other higher regulatory standards, and state mandated regulatory standards. Credit is also provided for a BCEGS

classification of 4/4 and for staff education and certification as a floodplain manager. The Town of Cutler Bay has several CFMs on staff and is trying to add more.

Stormwater Management

Stormwater runoff is increased when natural ground cover is replaced by urban development. Development in the watershed that drains to a river can aggravate downstream flooding, overload the community's drainage system, cause erosion, and impair water quality.

There are three ways to prevent flooding problems caused by stormwater runoff:

1) Regulating development in the floodplain to ensure that it will be protected from flooding and that it won't divert floodwaters onto other properties, and

2) Regulating all development to ensure that the post-development peak runoff will not be greater than it was under pre-development conditions.

3) Set construction standards so buildings are protected from shallow water.

Local Implementation

The Town's Stormwater Master Plan created in March 2008 identifies opportunities to protect surface water quality and reduce flooding within the Town limits. The Stormwater Master Plan includes the following components:

- A review of existing stormwater and drainage data, reports and plans available through SFWMD, Miami-Dade County and Town sources
- A field inventory of existing drainage structures
- A drainage atlas including the type, size and general location of drainage infrastructure elements
- Basin and sub-basin delineations based on available survey data and other sources
- Hydrologic and hydraulic modeling analysis of the existing systems and their capacity to handle the 5-year/24-hour, 10-year/24-hour, 25-year/72-hour, 50-year/72-hour, and 100-year/72-hour storm events
- Identification and analysis of alternatives for improvements needed to alleviate deficiencies identified in the hydrologic and hydraulic modeling phase
- Development of an optional Capital Improvement Plan (CIP) to implement the identified improvements

The performance goals representing the minimum standards for sub-basin performance are as follows:

- During the five-year return design storm event, flooding in local and collector roadways travel lanes should not exceed the edge of the roadway pavement. This goal is consistent with SFWMD and Miami-Dade County requirements.
- During the 10-year return design storm event, flooding in roadway travel lanes should be below the crown of the roadway. This goal is consistent with Miami-Dade County requirements.
- During the 100-year return design storm event, flooding should be below the building finish floor elevations. This goal is consistent with Miami-Dade County requirements.
- Drainage sub-basins which discharge directly into canals should have water quality pre-treatment for the first one inch of runoff. This standard is consistent with federal, state and county water quality treatment requirements.
- Drainage sub-basins which discharge directly into lakes or drainage wells should have water quality pre-treatment for the first one-half inch of runoff. This standard is consistent with federal, state and county water quality treatment requirements.

Reducing Future Flood Losses
Stormwater management and the requirement that post development runoff cannot exceed pre-development conditions is a great way to prevent future flood losses. Because Miami-Dade County has similar stormwater requirements, Cutler Bay benefits by having no one up stream controlling runoff from development in a different manner. Retention and detention requirements help to reduce future flood losses.

CRS Credit
Cutler Bay currently receives credit for Activity 450 – Stormwater Management. The community enforces regulations for stormwater management, freeboard in non-SFHA zones, soil and erosion control and water quality.

Conclusions (Adoption or revisions of such plans and ordinances)

- State administration of mobile or manufactured homes does not guarantee that they will be adequately tied down or protected from flooding or other hazards
- Most zoning ordinances don't designate floodplain as a special type of district
- It is not feasible for a local community to exceed state building code requirements

Recommendations

- The Town of Cutler Bay should continue to implement activities in the CRS Program under the guidance of the 2013 CRS Coordinator's Manual
- Cutler Bay should consider adding one additional foot of Freeboard
- Cutler Bay should not consider changing its Growth Management Plan as the largest open space tract of land within the Town is already identified as "conservation" with no development allowed.

B.4.2 Property Protection Measures

Property protection measures are used to modify buildings or property subject to damage. Property protection measures fall under three approaches:

- Modify the site to keep the hazard from reaching the building,
- Modify the building (retrofit) so it can withstand the impacts of the hazard, and
- Insure the property to provide financial relief after the damage occurs.

Property protection measures are normally implemented by the property owner, although in many cases technical and financial assistance can be provided by a government agency.

Keeping the Hazard Away

Generally, natural hazards do not damage vacant areas. As noted earlier, the major impact of hazards is to people and improved property. In some cases, properties can be modified so the hazard does not reach the damage-prone improvements. For example, a berm can be built to prevent floodwaters from reaching a house.

Flooding
There are five common methods to keep a flood from reaching and damaging a building:

- Erect a barrier between the building and the source of the flooding.
- Move the building out of the floodprone area.

- Elevate the building above the flood level.
- Demolish the building.
- Replace the building with a new one that is elevated above the flood level.

Barriers

A flood protection barrier can be built of dirt or soil (a "berm") or concrete or steel (a "floodwall"). Careful design is needed so as not to create flooding or drainage problems on neighboring properties. Depending on how porous the ground is, if floodwaters will stay up for more than an hour or two, the design needs to account for leaks, seepage of water underneath, and rainwater that will fall inside the perimeter. This is usually done with a sump or drain to collect the internal groundwater and surface water and a pump and pipe to pump the internal drainage over the barrier.

Barriers can only be built so high. They can be overtopped by a flood higher than expected. Barriers made of earth are susceptible to erosion from rain and floodwaters if not properly sloped, covered with grass, and properly maintained. A berm can also settle over time, lowering its protection level. A floodwall can crack, weaken, and lose its watertight seal. Therefore, barriers need careful design and maintenance (and insurance on the building, in case of failure).

Relocation

Moving a building to higher ground is the surest and safest way to protect it from flooding. While almost any building can be moved, the cost increases for heavier structures, such as those with exterior brick and stone walls, and for large or irregularly shaped buildings. However, experienced building movers can handle any job. In areas subject to flash flooding, deep waters, or other high hazard, relocation is often the only safe approach. Relocation is also preferred for large lots that include buildable areas outside the floodplain or where the owner has a new flood-free lot (or portion of the existing lot) available.

Building Elevation

Raising a building above the flood level can be almost as effective as moving it out of the floodplain. Water flows under the building, causing little or no damage to the structure or its contents. Raising a building above the flood level is cheaper than moving it and can be less disruptive to a neighborhood. Elevation has proven to be an acceptable and reasonable means of complying with floodplain regulations that require new, substantially improved, and substantially damaged buildings to be elevated above the base flood elevation.

Demolition

Some buildings, especially heavily damaged or repetitively flooded ones, are not worth the expense to protect them from future damages. It is cheaper to demolish them and either replace them with new, flood protected structures, or relocate the occupants to a safer site. Demolition is also appropriate for buildings that are difficult to move - such as larger, slab foundation or masonry structures - and for dilapidated structures that are not worth protecting. Generally, demolition projects are undertaken by a government agency, so the cost is not borne by the property owner, and the land is converted to public open space use, like a park.

Pilot Reconstruction

If a building is not in good shape, elevating it may not be worthwhile or it may even be dangerous. An alternative is to demolish the structure and build a new one on the site that meets or exceeds all flood protection codes. FEMA funding programs refer to this approach as "pilot reconstruction." It is still a pilot program, and not a regularly funded option. Certain rules must be followed to qualify for federal funds for pilot reconstruction:

- Pilot reconstruction is only possible after it has been shown that acquisition or elevation are not feasible, based on the program's criteria.
- Funds are only available to people who owned the property at the time of the event for which funding is authorized.

- It must be demonstrated that the benefits exceed the costs.
- The new building must be elevated to the advisory base flood elevation.
- The new building must not exceed more than 10% of the old building's square footage.
- The new building must meet all flood and wind protection codes.
- There must be a deed restriction that states the owner will buy and keep a flood insurance policy.
- The maximum federal grant is 75% of the cost, up to $150,000. FEMA is developing a detailed list of eligible costs to ensure that disaster funds are not used to upgrade homes.
-

Local Implementation

The Town of Cutler Bay does not currently receive credit for Activity 520 – Acquisition and Relocation or Activity 530 – Flood Protection.

CRS Credit

The CRS provides the most credit points for acquisition and relocation under Activity 520, because this measure permanently removes insurable buildings from the floodplain. The CRS credits barriers and elevating existing buildings under Activity 530. Elevating a building above the flood level will also reduce the flood insurance premiums on that individual building. Because barriers are less secure than elevation, not as many points are provided. Higher scores are possible, but they are based on the number of buildings removed compared to the number remaining in the floodplain.

Retrofitting

An alternative to keeping the hazard away from a building is to modify or retrofit the site or building to minimize or prevent damage. There are a variety of techniques to do this, as described below.

Dry Floodproofing

Dry floodproofing means making all areas below the flood protection level watertight. Walls are coated with waterproofing compounds or plastic sheeting. Openings, such as doors, windows and vents, are closed, either permanently, with removable shields, or with sandbags. Dry floodproofing of new and existing nonresidential buildings in the regulatory floodplain is permitted under state, FEMA and local regulations. Dry floodproofing of existing residential buildings in the floodplain is also permitted as long as the building is not substantially damaged or being substantially improved. Owners of buildings located outside the regulatory floodplain can always use dry floodproofing techniques.

Dry floodproofing is only effective for shallow flooding, such as repetitive drainage problems. It does not protect from the deep flooding along lakes and larger rivers caused by hurricanes or other storms.

Wet Floodproofing

The alternative to dry floodproofing is wet floodproofing: water is let in and everything that could be damaged by a flood is removed or elevated above the flood level. Structural components below the flood level are replaced with materials that are not subject to water damage. For example, concrete block walls are used instead of wooden studs and gypsum wallboard. The furnace, water heater and laundry facilities are permanently relocated to a higher floor. Where the flooding is not deep, these appliances can be raised on blocks or platforms.

Local Implementation
The Town of Cutler Bay does not currently receive credit for Activity 530 – Flood Protection.

CRS Credit
The credit for Activity 530 is based on the combination of flood protection techniques used and the level of flood protection provided. Points are calculated for each protected building. Bonus points are provided for the protection of repetitive loss buildings and critical facilities.

Insurance

Technically, insurance does not mitigate damage caused by a natural hazard. However, it does help the owner repair, rebuild, and hopefully afford to incorporate some of the other property protection measures in the process. Insurance offers the advantage of protecting the property, as long as the policy is in force, without requiring human intervention for the measure to work.

Private Property
Although most homeowner's insurance policies do not cover a property for flood damage, an owner can insure a building for damage by surface flooding through the NFIP. Flood insurance coverage is provided for buildings and their contents damaged by a "general condition of surface flooding" in the area. Most people purchase flood insurance because it is required by the bank when they get a mortgage or home improvement loan. Usually these policies just cover the building's structure and not the contents. Contents coverage can be purchased separately. Renters can buy contents coverage, even if the owner does not buy structural coverage on the building. Most people don't realize that there is a 30-day waiting period to purchase a flood insurance policy and there are limits on coverage.

Public Property
Governments can purchase commercial insurance policies. Larger local governments often self-insure and absorb the cost of damage to one facility, but if many properties are exposed to damage, self-insurance can drain the government's budget. Communities cannot expect federal disaster assistance to make up the difference after a flood.

Under Section 406(d) of the Stafford Act:

> "If an eligible insurable facility damaged by flooding is located in a [mapped floodplain] … and the facility is not covered (or is underinsured) by flood insurance on the date of such flooding, FEMA is required to reduce Federal disaster assistance by the maximum amount of insurance proceeds that would have been received had the buildings and contents been fully covered under a National Flood Insurance Program (NFIP) standard flood insurance policy. [Generally, the maximum amount of proceeds for a non-residential property is $500,000.]

[Communities] Need to:

- Identify all insurable facilities, and the type and amount of coverage (including deductibles and policy limits) for each. The anticipated insurance proceeds will be deducted from the total eligible damages to the facilities.
- Identify all facilities that have previously received Federal disaster assistance for which insurance was required. Determine if insurance has been maintained. A failure to maintain the required insurance for the hazard that caused the disaster will render ineligible for Public Assistance funding…
- [Communities] must obtain and maintain insurance to cover [their] facility - buildings, equipment, contents and vehicles - for the hazard that caused the damage in order to receive Public Assistance funding. Such coverage must, at a minimum, be in the amount of the eligible

project costs. FEMA will not provide assistance for that facility in future disasters if the requirement to purchase insurance is not met. - FEMA Response and Recovery Directorate Policy No. 9580.3, August 23, 2000

- In other words, the law expects public agencies to be fully insured as a condition of receiving federal disaster assistance.

Local Implementation

Flood insurance information for the Town is provided in Section 3.2.4. A Program for Public Information is currently under development.

CRS Credit

There is no credit for purchasing flood insurance, but the CRS does provide credit for local public information programs that explain flood insurance to property owners. The CRS also reduces the premiums for those people who do buy NFIP coverage. The Town of Cutler Bay currently receives credit for Activity 330 – Outreach Projects.

Conclusions

- There are several ways to protect properties from flood damage. The advantages and disadvantages of each should be carefully examined for that particular situation
- Property owners can implement some property protection measures at little cost, especially for sites in areas of low level flooding
- Approximately 25% of properties in Cutler Bay have a flood insurance policy
- The local government can promote and support property protection through outreach and financial incentives
- Property protection measures can protect the most flood-prone buildings in the Town such as those which are repetitively flooded

Recommendations

- Encourage homeowners to take responsibility for protecting their own properties by providing retrofitting advice and assistance
- Encourage the promotion of flood insurance to increase the policy base in Cutler Bay
- Target Repetitive loss properties by leveraging, local, state, and federal funding opportunities

B.4.3 Natural Resource Protection

Resource protection activities are generally aimed at preserving (or in some cases restoring) natural areas. These activities enable the naturally beneficial functions of fields, floodplains, wetlands, and other natural lands to operate more effectively. Natural and beneficial functions of watersheds, floodplains and wetlands include:

- Reduction in runoff from rainwater and snow melt in pervious areas
- Infiltration that absorbs overland flood flow
- Removal and filtering of excess nutrients, pollutants and sediments
- Storage of floodwaters
- Absorption of flood energy and reduction in flood scour
- Water quality improvement
- Groundwater recharge
- Habitat for flora and fauna
- Recreational and aesthetic opportunities

As development occurs, many of the above benefits can be achieved through regulatory steps for protecting natural areas or natural functions. This section covers the resource protection programs and standards that can help mitigate the impact of natural hazards, while they improve the overall environment. Seven areas are reviewed:

- Wetland protection
- Erosion and sedimentation control
- River restoration
- Best management practices
- Dumping regulations
- Urban forestry
- Farmland protection

Wetland Protection

Wetlands are often found in floodplains and topographically depressed areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flows. They also serve as a natural filter, which helps to improve water quality, and they provide habitat for many species of fish, wildlife and plants.

Local Implementation

According to the Town's Comprehensive Growth Management Plan, the Town contains significant coastal wetlands adjacent to Biscayne National Park. These wetlands are an important component of South Florida's ecosystem, and will be conserved and, where appropriate, restored. Approximately 1,430 acres of these wetlands are in public ownership, and all are designated for Conservation purposes.

The Comprehensive Everglades Restoration Plan (CERP) is a plan to restore and preserve the Everglades, enhance water supplies, and maintain flood protection. The U.S. Army Corps of Engineers has partnered with the South Florida Water Management District and numerous other local, state, tribal and federal partners to reach a common goal based on a "vision" for the future quality of the natural and human systems in South Florida. The Biscayne Bay Coastal Wetlands phase of CERP is located along the undeveloped lands that make up the south and eastern areas of the Town of Cutler Bay. The project benefits will include restoring Biscayne Bay which includes Biscayne National Park.

Objective C-6 in the Town's Comprehensive Growth Management Plan is to ensure that identified wetlands under county, regional, state or federal jurisdiction are protected from unlawful, intrusive actions that could result in environmental damage or degradation.

CRS Credit

There is credit for preserving open space in its natural condition or restored to a state approximating its natural condition. The credit is based on the percentage of the floodplain that can be documented as wetlands protected from development by ownership or local regulations. The Town of Cutler Bay currently receives credit for Activity 420 – Open Space Preservation.

Erosion and Sedimentation Control

Farmlands and construction sites typically contain large areas of bare exposed soil. Surface water runoff can erode soil from these sites, sending sediment into downstream waterways. Erosion also occurs along stream banks and shorelines as the volume and velocity of flow or wave action destabilize and wash away the soil.

Sediment suspended in the water tends to settle out where flowing water slows down. This can clog storm drains, drain tiles, culverts and ditches and reduce the water transport and storage capacity of river and stream channels, lakes and wetlands. When channels are constricted and flooding cannot deposit sediment in the bottomlands, even more sediment is left in the channels. The result is either clogged streams or increased dredging costs.

Not only are the drainage channels less able to perform their job, but the sediment in the water reduces light, oxygen and water quality, and often carries chemicals, heavy metals and other pollutants. Sediment has been identified by the US EPA as the nation's number one nonpoint source pollutant for aquatic life.

There are two principal strategies to address these problems: minimize erosion and control sedimentation. Techniques to minimize erosion include phased construction, minimal land clearing, and stabilizing bare ground as soon as possible with vegetation and other soil stabilizing practices.

If erosion occurs, other measures are used to capture sediment before it leaves the site. Silt fences, sediment traps and vegetated filter strips are commonly used to control sediment transport. Runoff from the site can be slowed down by terraces, contour strip farming, no-till farm practices, hay or straw bales, constructed wetlands, and impoundments (e.g., sediment basins and farm ponds). Slowing surface water runoff on the way to a drainage channel increases infiltration into the soil and reduces the volume of topsoil eroded from the site.

Erosion and sedimentation control regulations mandate that these types of practices be incorporated into construction plans. The most common approach is to require applicants for permits to submit an erosion and sediment control plan for the construction project. This allows the applicant to determine the best practices for the site.

Local Implementation
Cutler Bay's ordinances do include standards for erosion and sedimentation control and Cutler Bay does currently receive credit for Activity 450 – Stormwater Management.

CRS Credit
Credit is available for the Erosion and Sediment Control (ESC) element under Activity 450 for regulating activities throughout the watershed to minimize erosion on construction sites that result could in sedimentation and water pollution.

Stream Restoration

There is a growing movement that has several names, such as "stream conservation," "bioengineering," or "riparian corridor restoration." The objective of these approaches is to return streams, stream banks and adjacent land to a more natural condition, including the natural meanders. Another term is "ecological restoration," which restores native indigenous plants and animals to an area.

A key component of these efforts is to use appropriate native plantings along the banks that resist erosion. This may involve retrofitting the shoreline with willow cuttings, wetland plants, or rolls of landscape material covered with a natural fabric that decomposes after the banks are stabilized with plant roots.

In all, restoring the right vegetation to a stream has the following advantages:

- Reduces the amount of sediment and pollutants entering the water
- Enhances aquatic habitat by cooling water temperature
- Provides food and shelter for both aquatic and terrestrial wildlife

- Can reduce flood damage by slowing the velocity of water
- Increases the beauty of the land and its property value
- Prevents property loss due to erosion
- Provides recreational opportunities, such as hunting, fishing and bird watching
- Reduces long-term maintenance costs

Local Implementation

The following restoration based objectives and policies can be found in the Town's Comprehensive Growth Management Plan. Each objective has supporting policies upon which Town regulations can be based:

Coastal Management

- Protect, conserve and enhance coastal wetlands and living marine resources within the coastal area of the Town of Cutler Bay.
- The Town will support Miami-Dade County to reduce the number of instances water quality standards are exceeded for coastal and estuarine waters.
- The Town shall minimize the disturbance of natural shorelines that provide stabilization and protect landward areas from storm impacts.
- Areas that are used for nesting, feeding or congregation by endangered and threatened species shall be protected from alteration and human activities that would further imperil those species.

Conservation

- The Town will conserve and protect the remaining natural systems of Cutler Bay in recognition of the inherent values of these areas left in their natural state.
- The Town will set management standards in the Land Development Regulations for environmentally sensitive natural systems. The standards will cover water resources, wetlands, and native habitats of flora and fauna.
- The Town will protect and conserve remaining coastal wetlands, living marine resources and wildlife habitats as evident within the coastal areas of Cutler Bay through policies outlined in the Coastal Management Element of the Comprehensive Growth Management Plan.
- The Town will ensure that wildlife and plant species listed as endangered, threatened, or of special concern that inhabit the environments in Cutler Bay are protected and enhanced where possible.
- The Town will require the preservation of native trees during development or redevelopment wherever possible and if any native trees must be removed, the same type of native trees shall be planted to replace the removed tree. More than one replacement tree shall be planted for every single tree that is removed.

CRS Credit

The Town of Cutler Bay currently receives credit for Activity 420 – Open Space Preservation. The CRS provides credit for preserving open space in its natural condition or restored to a state approximating its natural condition. There are also credits for channel setbacks, buffers and protecting shorelines.

Best Management Practices

Point source pollutants come from pipes such as the outfall of a municipal wastewater treatment plant. They are regulated by the US EPA. Nonpoint source pollutants come from non-specific locations and harder to regulate. Examples of nonpoint source pollutants are lawn fertilizers, pesticides, other chemicals, animal wastes, oils from street surfaces and industrial areas, and sediment from agriculture,

construction, mining and forestry. These pollutants are washed off the ground's surface by stormwater and flushed into receiving storm sewers, ditches and streams.

The term "best management practices" (BMPs) refers to design, construction and maintenance practices and criteria that minimize the impact of stormwater runoff rates and volumes, prevent erosion, protect natural resources and capture nonpoint source pollutants (including sediment). They can prevent increases in downstream flooding by attenuating runoff and enhancing infiltration of stormwater. They also minimize water quality degradation, preserve beneficial natural features onsite, maintain natural base flows, minimize habitat loss, and provide multiple usages of drainage and storage facilities.

Local Implementation
In accordance with Cutler Bay's adopted Land Development Regulations, BMPs are defined as any activities, prohibitions, practices, procedures, programs, or other measures designed to prevent or reduce the discharge of pollutants directly or indirectly into waters of the United States. This shall include but are not limited to those measures specified in the stormwater best management practice handbooks for municipal, industrial/commercial, and construction activity and those measures identified by the Town. Furthermore, the water quality standard shall be met when the annual average for each of the listed National Pollutant Discharge Elimination System pollutants does not exceed target criteria within a canal basin as specified in the Land Development Regulations.

CRS Credit
The Town of Cutler Bay currently receives credit for Activity 450 – Stormwater Management. To receive WQ credit, the community's stormwater management regulations must either specify one or more measures or refer to BMPs as published in an official government reference.

Dumping Regulations

BMPs usually address pollutants that are liquids or are suspended in water that are washed into a lake or stream. Dumping regulations address solid matter, such as shopping carts, appliances and landscape waste that can be accidentally or intentionally thrown into channels or wetlands. Such materials may not pollute the water, but they can obstruct even low flows and reduce the channels' and wetlands' abilities to convey or clean stormwater.

Many cities have nuisance ordinances that prohibit dumping garbage or other "objectionable waste" on public or private property. Waterway dumping regulations need to also apply to "non-objectionable" materials, such as grass clippings or tree branches, which can kill ground cover or cause obstructions in channels. Regular inspections to catch violations should be scheduled.

Many people do not realize the consequences of their actions. They may, for example, fill in the ditch in their front yard without realizing that is needed to drain street runoff. They may not understand how regarding their yard, filling a wetland, or discarding leaves or branches in a watercourse can cause a problem to themselves and others. Therefore, a dumping enforcement program should include public information materials that explain the reasons for the rules as well as the penalties.

Local Implementation
Cutler Bay's ordinances makes it unlawful for anyone to deposit waste, grass, weeds, brush or other refuse in any street, ditch or watercourse, or on others' property, or on public property. It is also illegal to dispose of certain wastes in public sewers.

CRS Credit
The Town of Cutler Bay currently receives credit for Activity 540 – Drainage System Maintenance. Credit is provided under the Stream Dumping Regulations (SDR) element if the community has and publicizes regulations prohibiting dumping in streams and ditches.

Farmland Protection

Farmland protection is an important piece of comprehensive planning and zoning throughout the United States. The purpose of farmland protection is to provide mechanisms for prime, unique, or important agricultural land to remain as such, and to be protected from conversion to nonagricultural uses.

Frequently, farm owners sell their land to residential or commercial developers and the property is converted to non-agricultural land uses. With development comes more buildings, roads and other infrastructure. Urban sprawl occurs, which can lead to additional stormwater runoff and emergency management difficulties.

Farms on the edge of cities are often appraised based on the price they could be sold for to urban developers. This may drive farmers to sell to developers because their marginal farm operations cannot afford to be taxed as urban land. The Farmland Protection Program in the United States Department of Agriculture's 2002 Farm Bill (Part 519) allows for funds to go to state, tribal, and local governments as well as nonprofit organizations to help purchase easements on agricultural land to protect against the development of the land. Eligible land includes cropland, rangeland, grassland, pastureland, or forest land that is part of an agricultural operation. Certain lands within historical or archaeological resources are also included.

The hazard mitigation benefits of farmland protection are similar to those of open space preservation:

- Farmland is preserved for future generation,
- Farmland in the floodplain keeps damageable structures out of harm's way
- Farmland keeps more stormwater on site and lets less stormwater runoff downstream
- Rural economic stability and development is sustained
- Ecosystems are maintain, restored or enhanced
- The rural character and scenic beauty of the area is maintained

Local Implementation
According to the Town's Comprehensive Growth Management Plan, there are 1,401.4 acres (21%) of vacant, undeveloped land in the Town. Of these lands, 907.2 acres (14%) are protected from future development but privately owned; 118.3 (2%) are protected from future development by public ownership; and 375.9 acres (6%) are vacant and subject to development. In addition, there are 36.5 acres of agricultural lands in the Town. County policy is that no new agricultural uses may be permitted within the Urban Development Boundary (UDB), and existing agricultural uses in the UDB are generally transitioning to urban uses.

CRS Credit
The Town of Cutler Bay currently receives credit for Activity 420 – Open Space Preservation. The CRS provides credit for preserving open space in its natural condition or restored to a state approximating its natural condition.

Conclusions

- A hazard mitigation program can use resource protection programs to support protecting natural features that can mitigate the impacts of flooding
- Cutler Bay ordinances prohibit illicit discharges into public drainage areas or onto public or private property
- Preserving open space and natural areas will serve to benefit the natural resource areas and protect natural occurring processes and help to protect certain species of plants and animals

Recommendations

- The Town should work more closely with Biscayne National Park and Miami-Dade County to ensure the Cutler Wetlands are protected from any future development
- Cutler Bay should identify additional parcels that will not be well suited for development and encourage a public/private partnership to maintain them as open space.
- The Town should target outreach to its residents on the benefits of natural resource protection
- Revise local ordinance to require that landscapers be registered with the Town

B.4.4 Emergency Services Measures

Emergency services measures protect people during and after a disaster. A good emergency management program addresses all hazards, and it involves all local government departments. At the state level, emergency services programs are coordinated by the Florida Department of Emergency Management (FDEM). Locally, Cutler Bay's emergency services are coordinated by the Police and Public Works Department through Miami-Dade County's Emergency Management Program.

This section reviews emergency services measures following a chronological order of responding to an emergency. It starts with identifying an impending problem (threat recognition) and continues through post-disaster activities.

Threat Recognition

The first step in responding to a flood is to know when weather conditions are such that an event could occur. With a proper and timely threat recognition system, adequate warnings can be disseminated.

The National Weather Service (NWS) is the prime agency for detecting meteorological threats. Severe weather warnings are transmitted through NOAA's Weather Radio System. Local emergency managers can then provide more site-specific and timely recognition after the Weather Service issues a watch or a warning. A flood threat recognition system predicts the time and height of a flood crest. This can be done by measuring rainfall, soil moisture, and stream flows upstream of the community and calculating the subsequent flood levels.

On smaller rivers and streams, locally established rainfall and river gauges are needed to establish a flood threat recognition system. The NWS may issue a "flash flood watch." This is issued to indicate current or developing hydrologic conditions that are favorable for flash flooding in and close to the watch area, but the occurrence is neither certain nor imminent. These events are so localized and so rapid that a "flash flood warning" may not be issued, especially if no remote threat recognition equipment is available. In the absence of a gauging system on small streams, the best threat recognition system is to have local personnel monitor rainfall and stream conditions. While specific flood crests and times will not be predicted, this approach will provide advance notice of potential local or flash flooding.

Local Implementation

The Town monitors flood warnings issued by the County and operates under the County's Comprehensive Emergency Management Plan. The Miami-Dade Emergency Operations Center (EOC)

operates at one of three levels of readiness in order to carry out its mission. These levels are patterned to closely match the Florida Division of Emergency Management EOC activation levels to maintain consistent definitions.

CRS Credit

The Town of Cutler Bay currently receives credit for Activity 610 – Flood Warning Program. Credit can be received for using National Hurricane Center warnings and river flood stage predictions for the NWS's gages. The actual score is based on how much of the community's floodplain is affected by these systems.

Warning

The next step in emergency response following threat recognition is to notify the public and staff of other agencies and critical facilities. More people can implement protection measures if warnings are early and include specific detail.

The NWS issues notices to the public using two levels of notification:

- Watch: conditions are right for flooding, thunderstorms, tornadoes or winter storms.
- Warning: a flood, tornado, etc., has started or been observed.

A more specific warning may be disseminated by the community in a variety of ways. The following are the more common methods:

- Commercial or public radio or TV stations
- The Weather Channel
- Cable TV emergency news inserts
- Telephone trees/mass telephone notification
- NOAA Weather Radio
- Tone activated receivers in key facilities
- Outdoor warning sirens
- Sirens on public safety vehicles
- Door-to-door contact
- Mobile public address systems
- Email notifications

Multiple or redundant systems are most effective - if people do not hear one warning, they may still get the message from another part of the system. Each has advantages and disadvantages:

- Radio and television provide a lot of information, but people have to know when to turn them on. They are most appropriate for hazards that that develop over more than a day, such as a tropical storm, hurricane, or winter storm.
- NOAA Weather Radio can provide short messages of any impending weather hazard or emergency and advise people to turn on their televisions for more information, but not everyone has a Weather Radio.
- Outdoor warning sirens can reach many people quickly as long as they are outdoors. They do not reach people in tightly-insulated buildings or those around loud noise, such as at a factory, during a thunderstorm, or in air conditioned homes. They do not explain what hazard is coming, but people should know to turn on a radio or television when they hear the siren.

- Automated telephone notification services are also fast, but can be expensive and do not work when phone lines are down. Nor do they work for unlisted numbers, call screening services, or cellular service, unless people sign up for notifications.

Just as important as issuing a warning is telling people what to do in case of an emergency. A warning program should include a public information component.

StormReady

The National Weather Service established the StormReady program to help local governments improve the timeliness and effectiveness of hazardous weather related warnings for the public. To be officially StormReady, a community must:

- Establish a 24-hour warning point and emergency operations center
- Have more than one way to receive severe weather warnings and forecasts and to alert the public
- Create a system that monitors weather conditions locally
- Promote the importance of public readiness through community seminars
- Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises

Being designated a StormReady community by the National Weather Service is a good measure of a community's emergency warning program for weather hazards. It is also credited by the CRS.

Local Implementation

The Town of Cutler Bay is not currently designated as a StormReady community; however, Miami-Dade County is designated as StormReady. Should a storm threaten South Florida, the Miami-Dade County Office of Emergency Management will activate. During activation, the county will give regularly advisories to the media and to local municipalities. The Town of Cutler Bay then updates their website based on the latest advisories. The Town also provides up-to-date information on Town services during that time. The Cutler Bay police department is responsible for enforcing actions required during an emergency.

CRS Credit

The Town of Cutler Bay currently receives credit for Activity 610 – Flood Warning Program. Community Rating System credits are based on the number and types of warning media that can reach the community's flood prone population. Depending on the location, communities can receive credit for the telephone calling system and more credits if there are additional measures, like telephone trees. Being designated as a StormReady community can provide additional credits.

Response

The protection of life and property is the most important task of emergency responders. Concurrent with threat recognition and issuing warnings, a community should respond with actions that can prevent or reduce damage and injuries. Typical actions and responding parties include the following:

- Activating the emergency operations center (emergency preparedness)
- Closing streets or bridges (police or public works)
- Shutting off power to threatened areas (utility company)
- Passing out sand and sandbags (public works)
- Holding children at school or releasing children from school (school superintendent)
- Opening evacuation shelters (the American Red Cross)
- Monitoring water levels (public works)

- Establishing security and other protection measures (police)

An emergency action plan ensures that all bases are covered and that the response activities are appropriate for the expected threat. These plans are developed in coordination with the agencies or offices that are given various responsibilities.

A flood stage forecast map shows areas that will be under water at various flood stages. Different flood levels are shown as color coded areas, so the emergency manager can quickly see what will be affected. Emergency management staff can identify the number of properties flooded, which roads will be under water, which critical facilities will be affected, and who to warn. With this information, an advance plan can be prepared that shows problem sites and determines what resources will be needed to respond to the predicted flood level.

Emergency response plans should be updated annually to keep contact names and telephone numbers current and to ensure that supplies and equipment that will be needed are still available. They should be critiqued and revised after disasters and exercises to take advantage of the lessons learned and of changing conditions. The end result is a coordinated effort implemented by people who have experience working together so that available resources will be used in the most efficient manner possible.

Local Implementation
The Town of Cutler Bay Police Department and Public Works Department coordinates emergency management services with Miami-Dade County Office of Emergency Management.

CRS Credit
The Town of Cutler Bay currently receives credit for Activity 610 – Flood Warning Program.

Evacuation and Shelter

There are six key components to a successful evacuation:

- Adequate warning
- Adequate routes
- Proper timing to ensure the routes are clear
- Traffic control
- Knowledgeable travelers
- Care for special populations (e.g., the handicapped, prisoners, hospital patients, and schoolchildren)

Those who cannot get out of harm's way need shelter. Typically, the American Red Cross will staff a shelter and ensure that there is adequate food, bedding, and wash facilities. Shelter management is a specialized skill. Managers must deal with problems like scared children, families that want to bring in their pets, and the potential for an overcrowded facility.

Local Implementation
The Miami-Dade County Emergency & Evacuation Assistance Program (E&EAP) provides evacuation support to those residents who may require specialized transportation, whose medical needs prevent them from evacuating on their own or who may require evacuation assistance. Additionally, the program may also be utilized post disaster to provide other assistance to those who are at risk due to a disability, frailty or health issues and who elected to stay at home in the event of a hurricane or other disaster.

Miami-Dade County Office of Emergency Management partners with Dade County Public Schools and the American Red Cross (ARC) to operate Hurricane Evacuation Centers (HEC). These HECs provide refuges of last resort for those individuals who need to evacuate and are unable to make their own evacuation/sheltering arrangements, such as with friends, family, or in hotels outside of the evacuation zones.

The Miami-Dade County storm surge planning zones are based on the newest generation SLOSH model. Areas in Miami-Dade along canals and rivers and further inland have been identified as being at risk for storm surge based on this new data. Using evacuation maps, each zone or portions will be evacuated depending on the hurricane's track and projected storm surge, independent of the hurricane's category. Upon identification of a threat, the County will use local media to relay pertinent information, such as evacuations and shelter openings.

CRS Credit

Because it is primarily concerned with protecting insurable buildings, the CRS does not provide any special credit for evacuation or sheltering of people (minimal credit is given in Activity 510 - Floodplain Management for evacuation policies and procedures). It is assumed that the emergency response plan would include all necessary actions in response to a flood.

Post-Disaster Recovery and Mitigation

After a disaster, communities should undertake activities to protect public health and safety and facilitate recovery. Appropriate measures include:

- Patrolling evacuated areas to prevent looting
- Providing safe drinking water
- Monitoring for diseases
- Vaccinating residents for tetanus and other diseases
- Clearing streets
- Cleaning up debris and garbage

Following a disaster, there should be an effort to help prepare people and property for the next disaster. Such an effort would include:

- Public information activities to advise residents about mitigation measures they can incorporate into their reconstruction work
- Evaluating damaged public facilities to identify mitigation measures that can be included during repairs
- Identifying other mitigation measures that can lessen the impact of the next disaster
- Acquiring substantially or repeatedly damaged properties from willing sellers
- Planning for long-term mitigation activities
- Applying for post-disaster mitigation funds

Regulating Reconstruction

Requiring permits for building repairs and conducting inspections are vital activities to ensure that damaged structures are safe for people to reenter and repair. There is a special requirement to do this in floodplains, regardless of the type of disaster or the cause of damage. The NFIP requires that local officials enforce the substantial damage regulations. These rules require that if the cost to repair a building in the mapped floodplain equals or exceeds 50% of the building's market value, the building

must be retrofitted to meet the standards of a new building in the floodplain. In most cases, this means that a substantially damaged building must be elevated above the base flood elevation.

Local Implementation
The Town's Floodplain Management Ordinance requires that all new residential construction or substantial improvement shall have the lowest floor, including the basement, elevated to no lower than one foot above the base flood elevation.

CRS Credit
The CRS does credit post-disaster mitigation procedures if the policies and procedures are incorporated into a flood mitigation or multi-hazard plan through Activity 510 - Floodplain Management Planning.

Conclusions

- Miami-Dade County performs most emergency management functions for the Town of Cutler Bay
- Miami-Dade County provides all fire protection for the Town of Cutler Bay
- Cutler Bay participates in the Miami-Dade County Local Mitigation Strategy
- Cutler Bay has a significant number of senior living facilities with many in flood-prone areas

Recommendations

- Cutler Bay's (Public Works Department and Police Department who are designated as local emergency managers) emergency managers should work more closely with Miami-Dade County to identify vulnerable populations for evacuation purposes
- Cutler Bay should work with Miami-Dade County to work on protecting critical facilities and infrastructure that are potentially exposed to flood damage

B.4.5 Structural Projects

Four general types of flood control projects are reviewed here: levees, reservoirs, diversions, and dredging. These projects have three advantages not provided by other mitigation measures:

- They can stop most flooding, protecting streets and landscaping in addition to buildings
- Many projects can be built without disrupting citizens' homes and businesses
- They are constructed and maintained by a government agency, a more dependable long-term management arrangement than depending on many individual private property owners

However, as shown below, structural measures also have shortcomings. The appropriateness of using flood control depends on individual project area circumstances.

- Advantages
    - They may provide the greatest amount of protection for land area used
    - Because of land limitations, they may be the only practical solution in some circumstances
    - They can incorporate other benefits into structural project design, such as water supply and recreational uses
    - Regional detention may be more cost-efficient and effective than requiring numerous small detention basins

- Disadvantages
    - They can disturb the land and disrupt the natural water flows, often destroying wildlife habitat

- They require regular maintenance
- They are built to a certain flood protection level that can be exceeded by larger floods
- They can create a false sense of security
- They promote more intensive land use and development in the floodplain

Levees and Floodwalls

Probably the best known flood control measure is a barrier of earth (levee) or concrete (floodwall) erected between the watercourse and the property to be protected. Levees and floodwalls confine water to the stream channel by raising its banks. They must be well designed to account for large floods, underground seepage, pumping of internal drainage, and erosion and scour. Key considerations when evaluating the use of a levee include:

- Design and permitting costs
- Right of way acquisition
- Removal of fill to compensate for the floodwater storage that will be displaced by the levee
- Internal drainage of surface flows from the area inside the levee
- Cost of construction
- Cost of maintenance
- Mitigation of adverse impacts to wetlands and other habitats
- Loss of river access and views
- Creating a false sense of security, because while levees may reduce flood damage for smaller more frequent rain events, they may also overtop or breach in extreme flood events and subsequently create more flood damage than would have occurred without the levee

Reservoirs and Detention

Reservoirs reduce flooding by temporarily storing flood waters behind dams or in storage or detention basins. Reservoirs lower flood heights by holding back, or detaining, runoff before it can flow downstream. Flood waters are detained until the flood has subsided, and then the water in the reservoir or detention basin is released or pumped out slowly at a rate that the river can accommodate downstream.

Reservoirs can be dry and remain idle until a large rain event occurs. Or they may be designed so that a lake or pond is created. The lake may provide recreational benefits or water supply (which could also help mitigate a drought).

Flood control reservoirs are most commonly built for one of two purposes. Large reservoirs are constructed to protect property from existing flood problems. Smaller reservoirs, or detention basins, are built to protect property from the stormwater runoff impacts of new development.

Diversion

A diversion is a new channel that sends floodwaters to a different location, thereby reducing flooding along an existing watercourse. Diversions can be surface channels, overflow weirs, or tunnels. During normal flows, the water stays in the old channel. During floods, the floodwaters spill over to the diversion channel or tunnel, which carries the excess water to a receiving lake or river.

Dredging

Dredging is often viewed as a form of conveyance improvement. However, it has the following problems:

- Given the large volume of water that comes downstream during a flood, removing a foot or two from the bottom of the channel will have little effect on flood heights.

- Dredging is often cost prohibitive because the dredged material must be disposed of somewhere.
- Unless in-stream or tributary erosion is corrected upstream, the dredged areas usually fill back in within a few years, and the process and the expense have to be repeated.
- If the channel has not been disturbed for many years, dredging will destroy the habitat that has developed.

To protect the natural values of the stream, federal law requires a U.S. Army Corps of Engineers permit before dredging can proceed. This can be a lengthy process that requires a lot of advance planning and many safeguards to protect habitats, which adds to the cost of the project.

CRS Credit

Structural flood control projects that provide 100-year flood protection and that result in revisions to the Flood Insurance Rate Map are not credited by the CRS in order to avoid duplicating the larger premium reduction provided by removing properties from the mapped floodplain.

The CRS credits smaller flood control projects that meet the following criteria:

- They must provide protection to at least the 25-year flood
- They must meet certain environmental protection criteria
- They must meet federal, state and local regulations, such as the Corps of Engineers' 404 permit and State dam safety rules
- They must meet certain maintenance requirements

These criteria ensure that credited projects are well-planned and permitted. Any of the measures reviewed in this section would be recognized under Activity 530 - Flood Protection. Credit points are based on the type of project, how many buildings are protected, and the level of flood protection provided.

Local Implementation

The Town of Cutler Bay does not currently receive credit for Activity 530 - Flood Protection.

Conclusions

- There are many areas identified that experience flooding due to inadequate drainage systems including the Saga Bay area
- Canal bank erosion can affect adjacent properties and create a situation where the canal does not function properly
- Installing new outfalls can improve local street drainage in certain areas of the Town

Recommendations

- Improve drainage through the implementation of several projects identified in the Town's Capital Improvement Program
- Work with Miami-Dade County on repairing canals which have eroded, including a dredging project to widen the canal at a bridge for better flow
- Work with the Army Corps of Engineers on a new outfall to improve drainage

B.4.6 Public Information

Outreach Projects

Outreach projects are the first step in the process of orienting property owners to the hazards they face and to the concept of property protection. They are designed to encourage people to seek out more information in order to take steps to protect themselves and their properties.

Awareness of the hazard is not enough; people need to be told what they can do about the hazard. Thus, projects should include information on safety, health and property protection measures. Research has shown that a properly run local information program is more effective than national advertising or publicity campaigns. Therefore, outreach projects should be locally designed and tailored to meet local conditions.

Community newsletters/direct mailings: The most effective types of outreach projects are mailed or distributed to everyone in the community. In the case of floods, they can be sent only to floodplain property owners.

News media: Local newspapers can be strong allies in efforts to inform the public. Local radio stations and cable TV channels can also help. These media offer interview formats and cable TV may be willing to broadcast videos on the hazards.

Other approaches: Examples of other outreach projects include:

- Presentations at meetings of neighborhood, civic or business groups
- Displays in public buildings or shopping malls
- Signs in parks, along trails and on waterfronts that explain the natural features (such as the river) and their relation to the hazards (such as floods)
- Brochures available in municipal buildings and libraries
- Special meetings, workshops and seminars

Local Implementation

A community brochure is mailed to all properties in the community on an annual basis. An outreach brochure is mailed annually to all properties in the SFHA. The community also provides flood information at the Town Hall and distributes both a County and Town Hurricane Guide and prints flood information in the phone book. Cutler Bay maintains a Town website that provides flood protection information. The Town also provides direct mail to residents which include flood protection and property protection measures. Flood materials are also provided in the Miami-Dade County library.

CRS Credit

The Town of Cutler Bay currently receives credit under Activity 330 – Outreach Projects as well as Activity 350 – Flood Protection Information.

Real Estate Disclosure

Many times after a flood or other natural disaster, people say they would have taken steps to protect themselves if they had known they had purchased a property exposed to a hazard. There are some federal and state requirements about such disclosures:

- Federal law: Federally regulated lending institutions must advise applicants for a mortgage or other loan that is to be secured by an insurable building whether the property is in a floodplain as

shown on the Flood Insurance Rate Map. If so, flood insurance is required for buildings located within the floodplain if the mortgage or loan is federally insured.

- State law: State laws set standards for real estate sales and licensing of agents and brokers.

Local Implementation

Cutler Bay currently receives credits under Activity 340 – Hazard Disclosure for requiring local real estate agents to disclose flood hazards to prospective buyers.

Libraries and Websites

The two previous activities tell people that they are exposed to a hazard. The next step is to provide information to those who want to know more. The community library and local websites are obvious places for residents to seek information on hazards, hazard protection, and protecting natural resources. Books and pamphlets on hazard mitigation can be given to libraries, and many of these can be obtained for free from state and federal agencies. Libraries also have their own public information campaigns with displays, lectures and other projects, which can augment the activities of the local government. Today, websites are commonly used as research tools. They provide fast access to a wealth of public and private sites for information. Through links to other websites, there is almost no limit to the amount of up to date information that can be accessed on the Internet.

In addition to online floodplain maps, websites can link to information for homeowners on how to retrofit for floods or a website about floods for children.

Local Implementation

Cutler Bay provides flood materials through the Miami-Dade County library. The Town also provides flood protection information on their website.

CRS Credit

The Town of Cutler Bay currently receives credit under Activity 350 – Flood Protection Information. The Community Rating System provides credits for having a variety of flood references in the local public library and for providing similar material on municipal websites.

Technical Assistance

Hazard Information

Residents and business owners that are aware of the potential hazards can take steps to avoid problems or reduce their exposure to flooding. Communities can easily provide map information from FEMA's Flood Insurance Rate Maps (FIRMs) and Flood Insurance Studies. They may also assist residents in submitting requests for map amendments and revisions when they are needed to show that a building is located outside the mapped floodplain.

Some communities supplement what is shown on the FIRM with information on additional hazards, flooding outside mapped areas and zoning. When the map information is provided, community staff can explain insurance, property protection measures and mitigation options that are available to property owners. They should also remind inquirers that being outside the mapped floodplain is no guarantee that a property will never flood.

Property Protection Assistance

While general information provided by outreach projects or the library is beneficial, most property owners do not feel ready to retrofit their buildings without more specific guidance. Local building

department staffs are experts in construction. They can provide free advice, not necessarily to design a protection measure, but to steer the owner onto the right track. Building or public works department staffs can provide the following types of assistance:

- Visit properties and offer protection suggestions
- Recommend or identify qualified or licensed contractors
- Inspect homes for anchoring of roofing and the home to the foundation
- Explain when building permits are needed for home improvements.

Local Implementation
FEMA floodplain maps are available on Cutler Bay's website, and the Town responds to requests on whether a property is located in s Special Flood Hazard Area. Property protection measures are also included on the Town's website. Cutler Bay also responds to drainage complaints and provides technical advice and assistance to interested property owners and annually publicizes the service.

CRS Credit
Cutler Bay currently receives credit under Activity 360 – Flood Protection Assistance.

Public Information Program

A public information program (PPI) is a document that receives CRS credit. It is a review of local conditions, local public information needs, and a recommended plan of activities. A PPI consists of the following parts, which are incorporated into this plan:

- The local flood hazard
- The property protection measures appropriate for the flood hazard
- Flood safety measures appropriate for the local situation
- The public information activities currently being implemented within the community, including those being carried out by non-government agencies
- Goals for the community's public information program
- The outreach projects that will be done each year to reach the goals
- The process that will be followed to monitor and evaluate the projects

Local Implementation
A PPI for Cutler Bay is currently under development.

CRS Credit
The CRS provides credit for a PPI under Activity 330 – Outreach Projects.

Conclusions

- Cutler Bay has an aggressive public awareness and outreach program
- The Town targets citizens through its website, news media, public meetings, neighborhood meetings, special events and when construction projects are occurring throughout the Town

Recommendations

- Cutler Bay is in the process of developing a Program for Public Information (PPI) which used the FMPC in the process of developing this plan
- Work to improve flood insurance coverage in Cutler Bay
- Work with Insurance and Real Estate Agents to educate them on the flood risk

B.5 Mitigation Alternative Selection Criteria

The process for evaluating mitigation alternatives is located in section 4.3. The following criteria were used to select and prioritize proposed mitigation measures:

STPLE/E

- Social: Does the measure treat people fairly? (different groups, different generations)
- Technical: Will it work? (Does it solve the problem? Is it feasible?)
- Administrative: Do you have the capacity to implement and manage project?
- Political: Who are the stakeholders? Did they get to participate? Is there public support? Is political leadership willing to support?
- Legal: Does the organization have the authority to implement? Is it legal? Are there liability implications?
- Economic: Is it cost-beneficial? Is there funding? Does it contribute to the local economy or economic development?
- Environmental: Does it comply with environmental regulations?

Sustainable Disaster Recovery

- Quality of life
- Social equity
- Hazard mitigation
- Economic development
- Environmental protection/enhancement
- Community participation

Smart Growth Principles

- Infill versus sprawl
- Efficient use of land resources
- Full use of urban resources
- Mixed uses of land
- Transportation options
- Detailed, human-scale design

Other

- Does measure address area with highest risk?
- Does measure protect…
    - The largest # of people exposed to risk?
    - The largest # of buildings?
    - The largest # of jobs?
    - The largest tax income?
    - The largest average annual loss potential?
    - The area impacted most frequently?
    - Critical infrastructure
- What is timing of available funding?
- What is visibility of project?

- Community credibility

Prioritization Process

Since there was a five member committee which developed this Floodplain Mitigation Plan, a thorough discussion of each mitigation category occurred. Then within each specific mitigation category, a variety of projects were discussed and debated.

Consensus was reached on the specific projects identified in the mitigation action plan. The prioritization of High, Medium, and Low was reached based on the significance of the project and the overall impact to the goals and objectives of the plan. The FMPC was given this guidance for prioritization:

Priority Classification

High: Project should be completed within the next two years

Medium: Project should be completed within the next four years

Low: Project should be completed in five or more years

If the FMPC felt the project warranted a certain classification, they may have extended the timeframe for completion beyond what is describe d above because they believed the project was significant and would have an impact on reducing flooding in Cutler Bay.

Appendix C

Appendix C: References

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