# Flood Risk Report

## *Franklin County, Florida*

***Franklin County Unincorporated Areas***
***City of Apalachicola***
***City of Carrabelle***

Report Number 001
***1/24/2014***

***Final***

# Project Area Community List

| Community Name |
| --- |
| Franklin County Unincorporated Areas |
| City of Apalachicola |
| City of Carrabelle |

# Preface

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

This Flood Risk Report (FRR) provides non-regulatory information to help local or tribal officials, floodplain managers, planners, emergency managers, and others better understand their flood risk, take steps to mitigate those risks, and communicate those risks to their citizens and local businesses.

Flood risk is always changing, and there may be other studies, reports, or sources of information available that provide more comprehensive information. The FRR is not intended to be regulatory or the final authoritative source of all flood risk data in the project area. Rather, it should be used in conjunction with other data sources to provide a comprehensive picture of flood risk within the Unincorporated Areas of Franklin County, the City of Apalachicola and the City of Carrabelle.

# Table of Contents

# FLOOD RISK REPORT

# 1 Introduction

## 1.1 About Flood Risk

Floods are naturally occurring phenomena that can and do happen almost anywhere. In its most basic form, a flood is an accumulation of water over normally dry areas. Coastal floods become hazardous to people and property when inundation, wave action, and/or erosion occur in a developed area, causing losses. Mild flood losses may have little impact on people or property, such as damage to landscaping or the generation of unwanted debris. Severe flooding can destroy buildings, ruin crops, and cause critical injuries or death.

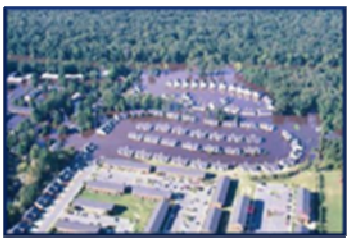
Flooding is a natural part of our world and our communities. Flooding becomes a significant hazard, however, when it intersects with the built environment.

### 1.1.1 Calculating Flood Risk

It is not enough to simply identify where flooding may occur. Just because one knows where a flood occurs does not mean they know the **risk** of flooding. The most common method for determining flood risk, also referred to as vulnerability, is to identify the probability of flooding and the consequences of flooding. In other words:

**Flood Risk** (or Vulnerability) **= Probability x Consequences**; where
**Probability** = the likelihood of occurrence
**Consequences** = the estimated impacts associated with the occurrence

**Which picture below shows more flood risk?**



**The probability of a flood** is the likelihood that a flood will occur. The probability of flooding can change based on physical, environmental, and/or contributing engineering factors. Factors affecting the probability that a flood will impact an area range from changing weather patterns to the existence of mitigation projects. The ability to assess the probability of a flood and the level of accuracy for that assessment are also influenced by modeling methodology advancements, better knowledge, and longer periods of record for the water body in question.

**The consequences of a flood** are the estimated impacts associated with the flood occurrence. Consequences relate to humans activities within an area and how a flood impacts the natural and built environments.

Even if you assume that the flood in both pictures was the same probability—let's say a 10-percent- annual-chance flood—the consequences in terms of property damage and potential injury as a result of the flood in the bottom picture are much more severe. Therefore, the flood risk in the area shown in the bottom picture is higher.

### 1.1.2 Risk MAP Flood Risk Products

Through Risk MAP, FEMA provides coastal communities with updated Flood Insurance Rate Maps (FIRMs) and Flood Insurance Studies (FISs) that focus on the probability of floods and that show where flooding and significant wave action may occur as well as the calculated 1% annual chance flood elevation. The 1% annual chance flood, also

known as the base flood, has a 1% chance of being equaled or exceeded in any given year. FEMA understands that flood risk is dynamic—that flooding does not stop at a line on a map—and as such, provides the following flood risk products:

Whether or not an area might flood is one consideration. The extent to which it might flood adds a necessary dimension to that understanding.

- Flood Risk Report (FRR): The FRR presents key risk analysis data for the Franklin County.
- Flood Risk Map (FRM): Like the example found in Section 3.1 of this document, the FRM shows a variety of flood risk information in the project area. More information about the data shown on the FRM may be found in Section 2 of this report.
- Flood Risk Database (FRD): The FRD is in GIS format and houses the flood risk data developed during the course of the flood risk analysis that can be used and updated by the community. After the Flood Risk Project is complete, this data can be used in many ways to visualize and communicate flood risk within Franklin County.

These Flood Risk Products provide flood risk information at the community level (for those portions of each community within the Flood Risk Project area). Community-level information is particularly useful for mitigation planning and emergency management activities, which often occur at a jurisdictional level.

## 1.2 Uses of this Report

The goal of this report is to help inform and enable communities and tribes to take action to reduce flood risk. Possible users of this report include:

- Local elected officials
- Floodplain managers
- Community planners
- Emergency managers
- Public works officials
- Other special interests (e.g., coastal conservation groups, environmental awareness organizations, etc.)

Vulnerability of infrastructure is another important consideration.

State, local, and tribal officials can use the summary information provided in this report, in conjunction with the data in the FRD, to:

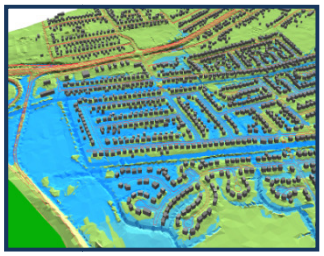
- **Update local hazard mitigation plans.** As required by the 2000 Federal Stafford Act, local hazard mitigation plans must be updated at least every five (5) years. Summary information presented in Section 3 of this report and the FRM can be used to identify areas that may need additional focus when updating the risk assessment section of a local hazard mitigation plan. Information found in Section 4 pertains to the different mitigation techniques and programs and can be used to inform decisions related to the mitigation strategy of local plans.
- **Update community comprehensive plans.** Planners can use flood risk information in the development and/or update of comprehensive plans, future land use maps, and zoning

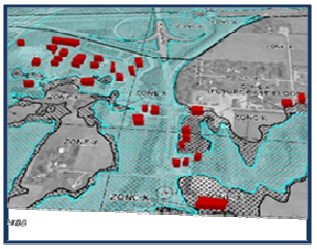
regulations. For example, zoning codes may be changed to better provide for appropriate land uses in high-hazard areas.

- **Update emergency operations and response plans.** Emergency managers can identify low-risk areas for potential evacuation and sheltering and can help first responders avoid areas of high-depth flood water. Risk assessment results may reveal vulnerable areas, facilities, and infrastructure for which planning for continuity of operations plans (COOP), continuity of government (COG) plans, and emergency operations plans (EOP) would be essential.
- **Develop hazard mitigation projects.** Local officials (e.g., planners and public works officials) can use flood risk information to re-evaluate and prioritize mitigation actions in local hazard mitigation plans.
- **Communicate flood risk.** Local officials can use the information in this report to communicate with property owners, business owners, and other citizens about flood risks, changes since the last FIRM, and areas of mitigation interest. The report layout allows community information to be extracted in a fact sheet format.
- **Inform the modification of development standards.** Floodplain managers, planners, and public works officials can use information in this report to support the adjustment of development standards for certain locations. For example, structures built in areas with a moderate wave hazard could benefit from the same building standards as those built in high wave hazard areas.

Buildings with foundations that withstand wave action are more likely to survive coastal flooding.

The Flood Risk Database, Flood Risk Map, and Flood Risk Report are "non-regulatory" products. They are available and intended for community use but are neither mandatory nor tied to the regulatory development and insurance requirements of the National Flood Insurance Program (NFIP). They may be used as regulatory products by communities if authorized by state and local enabling authorities.





FEMA data can be leveraged to identify and measure vulnerability by including local building information (i.e. building type). The examples above show various ways to display flooding intersecting with buildings.

## 1.3 Sources of Flood Risk Assessment Data Used

To assess potential community losses, or the consequences portion of the "risk" equation, the following data was collected for analysis and inclusion in Franklin County:

- Information about local assets or resources at risk of flooding
- Information about the physical features and human activities that contribute to that risk
- Information about where the risk is most severe

For Franklin County's Flood Risk Project, FEMA used the following sources of flood risk information to develop this report:

- Hazus estimated flood loss information
- New engineering analyses (e.g., coastal storm surge and wave modeling) to develop new flood elevations and boundaries

- Locally supplied data (see Section 7 for a description)
- Sources identified during the Discovery process

## 1.4 Related Resources

For a more comprehensive picture of flood risk, FEMA recommends that state and local officials use the information provided in this report in conjunction with other sources of flood risk data, such as those listed below.

- **FIRMs and FISs.** This information indicates areas with specific flood hazards by identifying the limit and extent of the 1-percent-annual-chance floodplain, the 0.2-percent-annual-chance floodplain, Primary Frontal Dunes, and wave hazards (VE Zones and the Limit of Moderate Wave Action (LIMWA)). FIRMs and FIS Reports do not necessarily identify all floodplains in a Flood Risk Project. The FIS Report includes summary information regarding other frequencies of stillwater (storm surge) flooding. In rural areas and areas for which flood hazard data are not available, the 1-percent-annual-chance floodplain may not be identified.
- **Hazus Flood Loss Estimation Reports.** Hazus can be used to generate reports, maps and tables on potential flood damage that can occur based on new/proposed mitigation projects or future development patterns and practices. Hazus can also run specialized risk assessments, such as what happens when a dam or levee fails. Flood risk assessment tools are available through other agencies as well, including the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Army Corps of Engineers (USACE). Other existing coastal or watershed reports may have a different focus, such as water quality, but may also contain flood risk and risk assessment information. See Section 6 for additional resources.
- **Flood or multi-hazard mitigation plans.** Local hazard mitigation plans include risk assessments that contain flood risk information and mitigation strategies that identify community priorities and actions to reduce flood risk. This report was informed by any existing mitigation plans in Franklin County.
- **Hurricane Evacuation Studies.** Produced through a joint effort by FEMA, NOAA, and USACE, Hurricane Evacuation Studies provide tools and information to the state and county emergency management offices to help determine who should evacuate during hurricane threats, and when those evacuations should occur. The information can be used to supplement or update hurricane evacuation plans and operational procedures for responding to hurricane threats.
- **Tsunami Inundation Maps.** Maps depicting tsunami inundation hazard zones are produced for coastal areas exposed to tsunami threats, typically those on with Pacific Ocean coasts. The mapping is accomplished through efforts coordinated by FEMA, NOAA, the U.S. Geological Survey (USGS), USACE, and numerous state and local agencies. The maps can be used by communities to supplement or update emergency management and evacuation plans.
- **FEMA Map Service Center (MSC).** The MSC has useful information, including fly sheets, phone numbers, data, etc. Letters of Map Change are also available through the MSC. The user can view FIRM databases and the National Flood Hazard Layer (NFHL) Database.

# 2 Flood Risk Analysis

## 2.1 Overview

Flood hazard identification uses FIRMs, and FIS Reports to identify where flooding can occur along with the probability and depth of that flooding. Flood risk assessment is the systematic approach to identifying how flooding impacts the environment. In hazard mitigation planning, flood risk assessments serve as the basis for mitigation strategies and actions by defining the hazard and enabling informed decision making. Fully assessing flood risk requires the following:

- Identifying the flooding source and determining the flood hazard occurrence probability
- Developing a complete profile of the flood hazard including historical occurrence and previous impacts
- Inventorying assets located in the identified flood hazard area
- Estimating potential future flood losses caused by exposure to the flood hazard area

Flooding impacts non-populated areas too, such as agricultural lands and wildlife habitats.

Flood risk analyses are different methods used in flood risk assessment to help quantify and communicate flood risk. Coastal flood risk analysis can be performed on a large scale (state, county) level and on a very small scale (parcel, census block). Advantages of large-scale coastal flood risk analysis, especially at county level, include identifying how actions and development in one community can affect surge and wave propagation of adjacent coastal areas. On the parcel or census block level, flood risk analysis can provide actionable data to individual property owners so they can take appropriate mitigation steps.

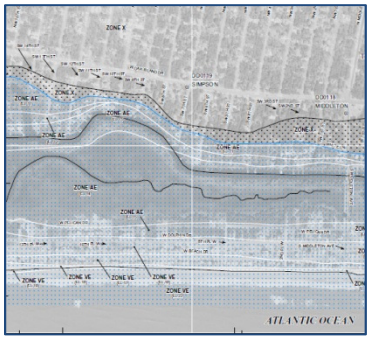
## 2.2 Analysis of Risk

The FRR, FRM, and FRD contain a variety of flood risk analysis information to help describe and visualize flood risk within the coastal study area. For Franklin County, this information includes the following elements:

- Changes Since Last FIRM
- Areas of Mitigation Interest
- Analysis Grids -Coastal Depth and Wave Height Grids
- Coastal Flood Risk Assessments
- Coastal Increased Inundation Areas
- Coastal Wave Hazard Severity Areas
- Primary Frontal dune (PFD) Erosion Areas

State and Local Hazard Mitigation Plans are required to have a comprehensive all-hazard risk assessment. The flood risk analyses in the FRR, FRM, and FRD can inform the flood hazard portion of a community's or state's risk assessment. Further, data in the FRD can be used to develop information that meets the requirements for risk assessments as it relates to the hazard of flood in hazard mitigation plans.

### 2.2.1 Changes Since Last FIRM




The Changes Since Last FIRM (CSLF) dataset, stored in the FRD and shown in Section 3 of this report, illustrates where changes to flood risk may have occurred since the last FIRM was published for the subject area. Communities can use this information to update their mitigation plans, specifically quantifying "what is at risk" and identifying possible mitigation activities.

The CSLF dataset identifies changes in the Special Flood Hazard Area (SFHA) since the previous FIRM was developed. These datasets quantify land area increases and decreases to the coastal SFHA, as well as areas where the flood zone designation has changed (e.g., Zone A to AE, AE to VE, shaded Zone X protected by levee to AE for de-accredited levees).

The CSLF dataset is created in areas that were previously mapped using digital FIRMs. The CSLF dataset for Franklin County includes:

- Floodplain and/or Zone Break Boundary Changes: Any changes to the existing floodplain or zone boundaries are depicted in this dataset
- Floodplain Designation Changes: This includes changed floodplain designations (e.g., Zone AE to Zone VE).
- CSLF Information: Within this dataset additional information is provided to help explain the floodplain boundary changes shown on the FIRM. This information is stored as digital attributes within the CSLF polygons and may include some or all of the following:
  - Changes in 1% SWEL
  - Changes in computed wave setup elevation
  - Changes to the modeling methodology (e.g., storm surge modeling)
  - Changed to the Primary Frontal Dune (PFD) boundary delineation due to sedimentation and/or erosion

It should be noted that reasons for the changes in the coastal SFHAs (also known as Contributing Engineering Factors) are intended to give the user a general sense of what caused the change, as opposed to providing a reason for each and every area of change.

CSLF data can be used to communicate changes in the physical flood hazard area (size, location) as part of the release of new FIRMS. It can also be used in the development or update of hazard mitigation plans to describe changes in hazard as part of the hazard profile.

CSLF data is shown in the FRR, and underlying data is stored in the FRD.

### 2.2.2 Flood Depth and Analysis Grids

Grids are FEMA datasets provided in the FRD to better describe the risk of the flood hazard. While the FIRM and FIS Report describe "what" is at risk by identifying the hazard areas, flood depth, and analysis grids can help define "how bad" the risk is within those identified areas. These grids are intended to be used by communities for additional analysis, enhanced visualization, and communication of flood risks for hazard mitigation planning

Grid data can make flood mapping more informative. The top image is a flood depth grid showing relative depths of water in a scenario flood event. The bottom image is a coastal wave height grid, which shows the height of waves in a scenario flood event.

and emergency management. The Flood Depth and Analysis Grids provide an alternative way to visualize how a particular flood characteristic (depth, wave heights, etc.) varies within the floodplain. Since they are derived from the engineering modeling results, they are typically associated with a particular frequency-based flooding event (e.g., 1% annual chance event). Grids provided in the Franklin County FRD include the following:

- **Flood Depth Grid (for the 1% annual chance flood frequency):** A Flood Depth Grid is created during the course of a Flood Risk Project. These grids communicate flood depth as a function of the difference between the calculated water surface elevation and the ground.

  Coastal flood depth grids are created for areas where the dominant wave hazard is overland wave propagation. The grid depicts the difference in elevation between the wave crest elevation and the ground. For Franklin County the depth grid for the 1-percent-annual-chance (base) flood for which overland wave propagation results are produced as a part of the FIS is provided in the FRD.

  Depth grids may form the basis for refined Hazus loss estimates (as presented in a table in Section 3 of this report) and are used to calculate potential flood losses for display on the FRM and for tabular presentation in this report. Depth grids may also be used for a variety of ad-hoc risk visualization and mitigation initiatives.

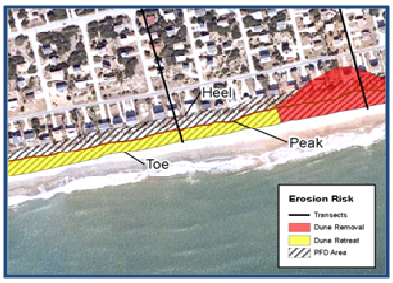
- **Coastal Wave Height Grid:** This dataset represents the controlling wave height for a given flood frequency. It depicts the exposure to the wave hazard component of coastal flooding. This raster reflects the controlling wave height typically computed along transects by the Wave Height Analysis for Flood Insurance Studies (WHAFIS) model for the 1-percent-annual-change (base) flood. Wave impacts are known to be a significant cause of damage to structures in the coastal zone.

Grid data can be used to communicate the variability of floodplains, such as where floodplains are particularly deep or hazardous, where residual risks lie behind levees, and where losses may be great after a flood event. For mitigation planning, grid data can inform the hazard profile and vulnerability analysis and can be used for preliminary benefit-cost analysis screening. For floodplain management, higher regulatory standards can be developed in higher hazard flood prone areas.

Grid data is stored in the FRD, and a list of available grid data is provided in the FRR. Visualizations of grids (maps) are not provided.

### 2.2.3 Coastal-Specific Datasets

Unique hazards are present in communities and locations along the coast. Because of the low and mildly sloping topography, some coastal communities may be exposed to large increases in inundated areas from only minor increases in water levels. Certain areas along the coast may also be more vulnerable to storm-induced coastal erosion, depending on the size and condition of coastal dunes. The following datasets provide information that help communicate some of these coastal-specific risks.




Coastal-specific flood risk datasets help identify and communicate the hazards that are unique to coastal communities.

- **Coastal Wave Hazard Severity Areas**

  This dataset represents the relative level of wave hazard severity within the 1-percent-annual-chance floodplain. Areas designated as coastal high hazard areas, Zone V or VE, including the primary frontal dune if present, are assigned a hazard rating of "High". A "Moderate" rating is given to non-V Zone areas with wave

heights between 1.5 – 3 feet. This "Moderate" area is especially beneficial to identify since FEMA encourages adoption of VE Zone NFIP regulations in these areas and provides CRS credit for doing so. In addition, if Franklin County has adopted building codes requiring higher building standards in Coastal A Zones, these could apply in "Moderate" hazard areas. A "Minimal" rating is given to non-V Zone areas with wave heights less than 1.5 feet. Additionally, if a community has building footprint information, this dataset can store a count of the number of structures located within each wave hazard classification polygon.

- **Coastal Increased Inundation Areas**

  The increased inundation dataset, stored in the FRD, illustrates the areas that would be exposed to flooding by flood levels that exceed a given flood frequency. The polygon dataset depicts areas that would be flooded by additional 1, 2, or 3 feet of flooding above the total water level elevation (stillwater plus waves) for a specified flood frequency. This product helps to communicate "what if" scenarios, e.g., what if a flood event exceeds the X-percent-annual-chance level by Y-feet, or, what if sea level rise causes flood levels to increase for the X-percent-annual-chance level, by highlighting the areas that would be inundated if flood levels increased.

### 2.2.4 Estimated Flood Loss Information

Flood loss estimates provided in the FRR were developed using a FEMA flood loss estimation tool, Hazus. Originally developed for earthquake risk assessment, Hazus has evolved into a multi-hazard tool developed and distributed by FEMA that can provide loss estimates for floods, earthquakes, and hurricane winds. Hazus is a nationally accepted, consistent flood risk assessment tool to assist individuals and communities to create a more accurate picture of flood risk. Some benefits of using Hazus include the following:

Hazus is a loss estimation methodology developed by FEMA for flood, wind, and earthquake hazards. The methodology and data established by Hazus can also be used to study other hazards.

- Outputs that can enhance state and local mitigation plans and help screen for cost-effectiveness in FEMA mitigation grant programs
- Analysis refinement through updating inventory data and integrating data produced using other flood models
- Widely available support documents and networks (Hazus Users Groups)

Files from the FRD can be imported into Hazus to develop other risk assessment information including:

- Debris generated after a flood event
- Dollar loss of the agricultural products in a study region
- Utility system damages in the region
- Vehicle loss in the study region
- Damages and functionality of lifelines such as highway and rail bridges, potable water, and wastewater facilities

**Scenario-Based Flood Loss Estimates:**

Scenario-based flood losses have been calculated for Franklin County using Hazus for the 10-, 2-, 1-, and 0.2-percent-annual-chance flood events. In this report, these losses are expressed in dollar amounts and are provided for Franklin County's project area only.

Loss estimates are based on best available data, and the methodologies applied result in an approximation of risk. These estimates should be used to understand relative risk from flood and potential losses. Uncertainties are inherent in any loss estimation methodology, arising in part from approximations and simplifications that are necessary for a comprehensive analysis (e.g., incomplete inventories, demographics, or economic parameters).

Flood loss estimates are being provided at the project and community levels for multiple flood frequencies including:

- **Residential Asset Loss**: These include direct building losses (estimated costs to repair or replace the damage caused to the building) for all classes of residential structures including single family, multi-family, manufactured housing, group housing, and nursing homes. This value also includes content losses.
- **Commercial Asset Loss**: These include direct building losses for all classes of commercial buildings including retail, wholesale, repair, professional services, banks, hospitals, entertainment, and parking facilities. This value also includes content and inventory losses.
- **Other Asset Loss**: This includes losses for facilities categorized as industrial, agricultural, religious, government, and educational. This value also includes content and inventory losses.
- **Business Disruption**: This includes the losses associated with the inability to operate a business due to the damage sustained during the flood. Losses include inventory, income, rental income, wage, and direct output losses, as well as relocation costs.
- **Annualized Losses**: Annualized losses are calculated using Hazus by taking losses from multiple events over different frequencies and expressing the long-term average by year. This factors in historic patterns of frequent smaller floods with infrequent but larger events to provide a balanced presentation of flood damage.
- **Loss Ratio:** The loss ratio expresses the scenario losses divided by the total building value for a local jurisdiction and can be a gage to determine overall community resilience as a result of a scenario event. For example, a loss ratio of 5 percent for a given scenario would indicate that a local jurisdiction would be more resilient and recover more easily from a given event, versus a loss ratio of 75 percent which

Hazus-estimated loss data can be used in many ways to support local decision making and explanation of flood risk. For mitigation planning purposes, loss data can be used to help meet requirements to develop loss information for the hazard of flood. Also, the FRM can show where flood risk varies by geographic location. For emergency management, Hazus data can help forecast losses based on predicted events, and resources can be assigned accordingly. Loss information can support floodplain management efforts, including those to adopt higher regulatory standards. *Also, awareness of exposed essential facilities and infrastructure encourages mitigation actions to protect citizens from service disruption should flooding occur.*

Hazus estimated loss data is summarized in the FRR and on the FRM and stored in the FRD.

would indicate widespread losses. An annualized loss ratio uses the annualized loss data as a basis for computing the ratio. Loss ratios are not computed for business disruption. These data are presented in the FRR.

- **Hazus Flood Risk Value:** On the FRM, flood risk is expressed in the following five categories: very low, low, medium, high, and very high for census blocks that have flood risk. It is based on the 1-percent-annual-chance total asset loss by census block.

### 2.2.5 Areas of Mitigation Interest

Many factors contribute to flooding and flood losses. Some are natural, and some are not. In response to these risks, there has been a focus by the federal government, state agencies, and local jurisdictions to mitigate properties against the impacts of flood hazards so that future losses and impacts can be reduced. An area identified as an Area of Mitigation Interest (AoMI) is an important element of defining a more comprehensive picture of flood risk and mitigation activity in Franklin County, identifying target areas and potential projects for flood hazard mitigation, encouraging local collaboration, and communicating how various mitigation activities can successfully reduce flood risk.

This report and the FRM may include information that focuses on identifying Areas of Mitigation Interest that may be contributing (positively or negatively) to flooding and flood losses in Franklin County. AoMIs are identified through coordination with local stakeholders; through revised hydrologic and hydraulic and/or coastal analyses; by leveraging other studies or previous flood studies; from community mitigation plans, floodplain management plans, and local surveys; and from the mining of federal government databases (e.g., flood claims, disaster grants, and data from other agencies). Below is a list of Areas of Mitigation Interest for Franklin County that have been identified in this Flood Risk Report, shown on the Flood Risk Map, and stored in the Flood Risk Database:

- **Coastal Structures**

Coastal structures, such as seawalls and revetments, are typically used to stabilize the shoreline to mitigate or prevent flood and/or erosion losses. Structures, such as jetties, groins and breakwaters, are constructed along naturally dynamic shorelines to alter the physical processes (e.g. sediment transport) for purposes that include reduction of long-term erosion rates, improvements to safe navigation (e.g., into ports), and reduction of erosive wave forces impacting a coast.

Due to the significant amounts of building permits allowed in coastal areas in Franklin County, it was determined to include all building permits issued between 1970 - 2013 as a coastal structure. This dataset helps identify not only structures which prevent flooding but also coastal structures which are at risk of flooding.

Bulkhead protecting an individual property along Big Bay from waves and erosion (above). Coastal Community's seawall and revetment (below).

- **Reasons coastal structures are considered AoMIs:**
  - While coastal structure may provide flood or erosion protection for one site, it might also interrupt the sediment transport process, resulting

in accelerated coastal erosion downdrift of the structure.

- Coastal structures are typically designed to withstand the forces associated with extreme design conditions of waves and water levels. Adequate protection may not be provided if these conditions are exceeded.
- As with other infrastructure such as roads, bridges, and utilities, regular maintenance of shoreline protection structures is essential to ensure that they continue to provide the intended protection from flooding and erosion.

- **At-Risk Essential Facilities**

Essential facilities, sometimes called "critical facilities," are those whose impairment during a flood could cause significant problems to individuals or communities. At risk essential facilities in Franklin County are indicated on the FRM. It should be noted that additional facilities may also be at risk. Franklin County may wish to consider siting these facilities outside of the floodplain or establishing staging areas on high ground outside of the floodplain for response and recovery activities.

- **Reasons at-risk essential facilities are considered AoMIs:**
  - Costly and specialized equipment may be damaged and need to be replaced.
  - Impairments to facilities such as fire stations may result in lengthy delays in responding and a focus on evacuating the facility itself.
  - Critical records and information stored at these facilities may be lost.

- **Areas of Significant Land Use Change**

Man-made modification and destruction of natural dune fields can results in the reduction and deterioration of the dune reservoir, thereby increasing overland flooding hazard landward of the dune field.

Additionally, changes in land use in areas vulnerable to coastal flooding may affect the severity of wave hazards. Wave energy dissipates as waves propagate through forested areas or areas with dense development while wave energy can increase in open areas such as agricultural fields or parking lots. Changes in land use can affect wave hazards beyond the immediate area of land use change.

Sometimes a major land use change may be for planning purposes only. For example, a land use change that rezones land from a classification such as floodplain that restricts development to a zone such as industrial or high density residential could result in significant new infrastructure and structures in high flood risk areas.

- **Reasons Areas of Significant Land Use Change are considered AoMIs:**
  - Deterioration –by constructions- of dune fields by flattening of the ground, which can increase inland flooding
  - Open areas can allow wave energy to increase while densely developed areas and dense vegetation cover often obstruct waves. These obstructions diminish the wave's potentially destructive forces in areas inland of the obstructions.

- Rezoning flood-prone areas to high densities and/or higher intensity uses can result in more people and property at risk of flooding and flood damage.

- **Areas of Mitigation Success**

Flood mitigation projects are powerful tools to communicate the concepts of mitigation and result in more resilient communities. Multiple agencies have undertaken flood hazard mitigation actions for decades. Both structural measures—those that result in flood control structures—and non-structural measures have been implemented in thousands of communities, including a grant received from the EPA to conduct a program titled "NWFWMD Eastpoint Regional Stormwater Management Systems".

- **Reasons areas of mitigation success are considered AoMIs:**
  - Mitigation successes identify those areas within the community that have experienced a reduction or elimination of flood risk.
  - Such areas are essential in demonstrating successful loss reduction measures and in educating citizens and officials on available flood hazard mitigation techniques.
  - Avoided losses can be calculated and shown.

- **Areas at risk of flooding from larger floods**

Portions of Franklin County are at risk of flooding from storms greater than the Base Flood. These areas are identified in the Coastal Increased Inundation Areas dataset. Areas potentially impacted by flood depths 1, 2, and 3-feet greater than the Base Flood depth are indicated and should be considered AOMI. Higher building standards in these areas and encouraging the purchase of flood insurance will increase the resiliency of these areas and their ability to recover following major floods.

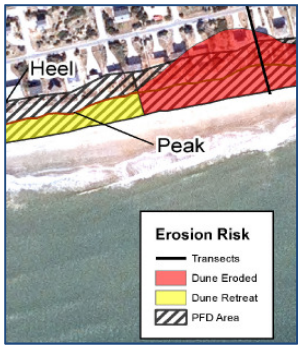
- **Reasons areas at risk of flooding from larger floods are considered AoMIs:**
  - Transportation routes within the county can be compared to determine which ones are at highest risk for being inundated.
  - CRS Credits are available for communities that enforce higher than regulatory standards within the special flood hazard areas.
  - Determinination of newly inundated critical and essential facilties
  - Improved risk awareness and communication

- **Areas of Significant Coastal Erosion**

Sandy beaches, barrier islands, and inlets are dynamic environments shaped by a number of factors, including: erosion, aggradation, deposition, and lateral migration. Beaches are constantly progressing towards a state of dynamic equilibrium involving ocean water and sediment supply.

Dunes play an important part in protecting Franklin County from flood and wave impacts. During the Flood Risk Project

Portion of Coastal Community's FRM showing an area (in red) where dunes have a higher risk of erosion, overtopping, and inundation.



process a number of areas were identified where Franklin County dunes have a higher risk of erosion, overwash, and inundation than other areas. These areas are identified in the Erosion Risk dataset and shown on the FRM. Franklin County should consider taking actions to increase the size and health of the dunes in these areas.

- **Reasons why areas of significant coastal erosion are considered AoMIs:**
  - Erosion of coastal barrier islands can result in breaches, washing out roads and cutting off access routes
  - Erosion often occurs along beaches during storms, especially severe storms that stay offshore for long durations and result in ongoing "battering" of the shoreline from high winds and waves. As the beach erodes, vulnerable properties are placed at even greater risk to coastal flooding from later storm surge, high tides, and wave action.
  - Erosion of marshland reduces the area of vegetation fringe by allowing faster penetration of surge and waves inland during a flooding event.

- **Other Flood Risk Areas**

An extensive search was done through available local and statewide datasets in an effort to determine at risk assets within the county. These additional datasets were determined to increase awareness and enhance the applicability of the Flood Risk Database. Utilizing GIS software Franklin County has access to the following datasets (This list in not all inclusive):

- Well Locations
- Contaminated Private Wells
- EPA Grant Funded Project areas
- Department of Transportation Bridge Locations
- Railroad Crossing Locations
- Rest Stops; Weigh Stations; Welcome Centers
- And more

# 3 Flood Risk Analysis Results

The following pages provide summary flood risk results for Franklin County as follows:

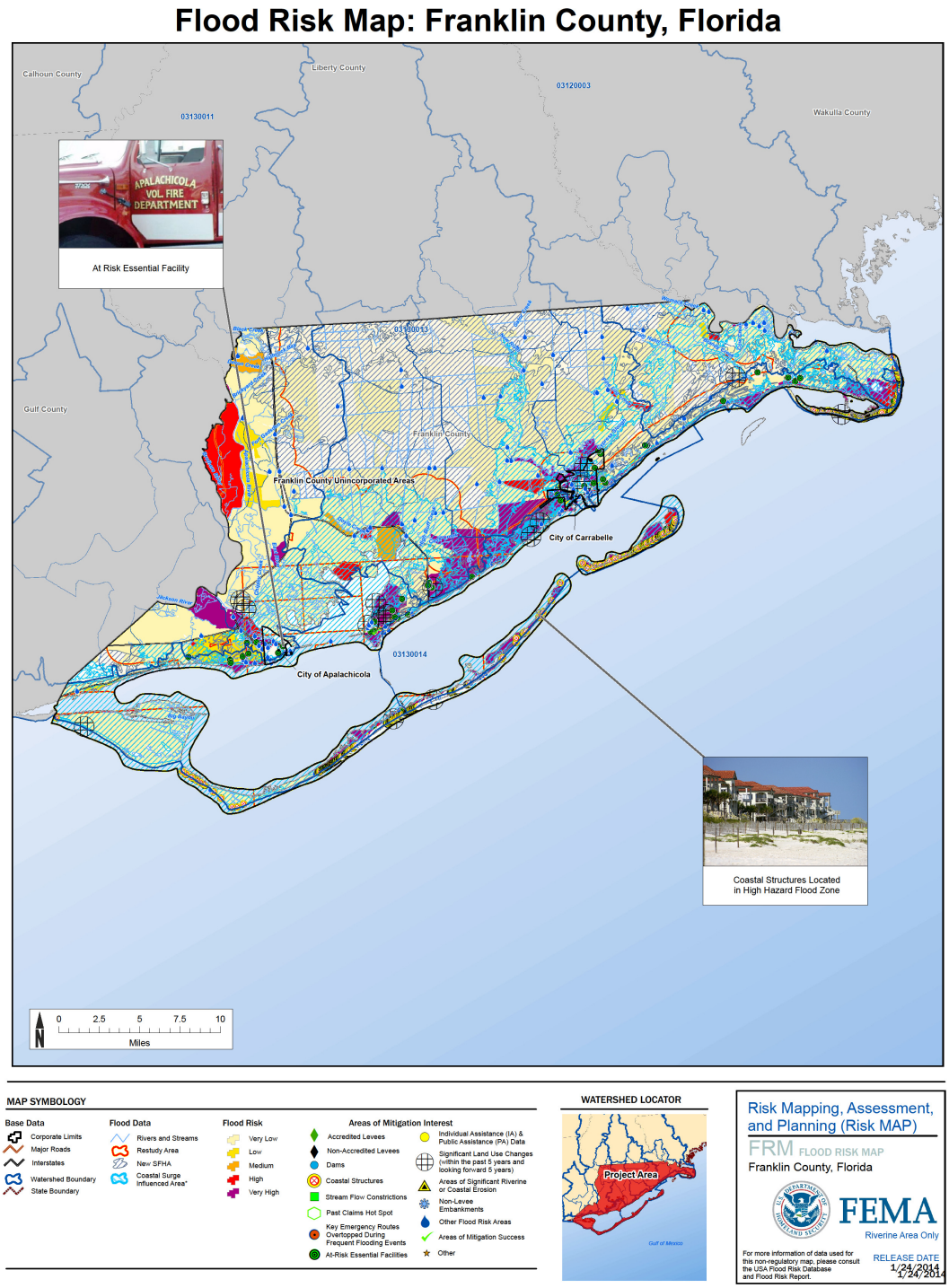
- **Flood Risk Map (FRM).** Within Franklin County the FRM displays base data reflecting community boundaries, major roads, and shorelines; potential losses that are either from the 2010 Average Annualized Loss (AAL) flood loss study or from the 2013 revised analysis; new Flood Risk Project areas; and graphics and text that promote access and usage of additional data available through the FRD, FIRM, and National Flood Hazard Layer and viewers (desktop or FEMA website, etc.). This information can be used to assist in Flood Risk Project-level planning as well as for developing mitigation actions within each jurisdiction located within Franklin County.

  The FRM provides a graphical overview of Franklin County should be noted, based on potential losses, exposed facilities, etc., based on data found in the FRD. Refer to the data in the FRD to conduct additional analyses.

- **Flood Risk Project Summary.** Franklin County, summary data for some or all of the following datasets are provided for the entire project area and also on a jurisdiction by jurisdiction basis:
  - **Changes Since Last FIRM (CSLF).** This is a summary of where the floodplain and flood zones have increased or decreased (only analyzed for areas that were previously mapped using digital FIRMs).
  - **Flood Depth and Analysis Grids.** A general discussion of the data provided in the FRD, including coastal analysis grids furnished as part of the project.
  - **Coastal-Specific Datasets.** A description of additional information provided for coastal communities to help communicate hazards and risk unique to them.
  - **Flood Risk Assessment Information.** A loss estimation of potential flood damages based on either from the 2010 Average Annualized Loss (AAL) flood loss study or from the 2013 revised analysis.
  - **Areas of Mitigation Interest.** A description of areas that may require mitigation or additional risk analysis.

## 3.1 Flood Risk Map

The Flood Risk Map for Franklin County is shown below. In addition to this reduced version of the map, a full size version is available within the FRD.



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## 3.2 Franklin County Flood Risk Project Area Summary

Franklin County is located along the Gulf of Mexico in the Southeast region of the country. It is composed of the Unincorporated Areas of Franklin County, the City of Apalachicola and the City of Carrabelle. This particular coastal study is of interest because a large portion of the population is located along the coastline.

### 3.2.1 Franklin County Overview

Franklin County includes the following communities:

| Community Name | CID | Total Community Population | Percent of Population in Floodplain | Total Community Land Area (sq mi) | Percent of Land Area in Floodplain | NFIP | CRS Rating | Mitigation Plan |
|---|---|---|---|---|---|---|---|---|
| Franklin County Unincorporated Areas | 120088 | 8,192 | 82% | 544.6 | 92% | Y | 7 | Y |
| City of Apalachicola | 120089 | 2,230 | 71% | 5.9 | 68% | Y | 10 | Y |
| City of Carrabelle | 120090 | 1,351 | 87% | 2.5 | 88% | Y | N/A | Y |

- Participating in the Franklin County Florida Local Mitigation Strategy.
- Past Federal Disaster Declarations for flooding = 16
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 2,984 policies totaling approximately $759,124,900
- NFIP-recognized repetitive loss properties = 106

Community-specific results are provided on subsequent pages. Data provided below and on subsequent pages only includes areas located within Franklin County's Flood Risk Project and do not necessarily represent community-wide totals.

Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

### 3.2.2 Flood Risk Datasets

As a part of the Franklin County Flood Risk Project, flood risk datasets were created for inclusion in the Flood Risk Database. Those datasets are summarized for Franklin County below:

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries and flood risk zones within Franklin County were updated due to new engineering analysis performed within the Flood Risk Project area. The updated modeling produced new flood zone areas and new base flood elevations in some areas

and leveraged recently developed LiDAR-based topographic data for Franklin County. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs and Coastal High Hazard Areas (CHHAs) for Franklin County.

| Area of Study | Total Area ($mi^2$) | Increase ($mi^2$) | Decrease ($mi^2$) | Net Change ($mi^2$) |
|---|---|---|---|---|
| Within SFHA | 553.3 | 48 | 14.3 | 33.7 |
| Within CHHA (Zone VE or V) | 115.7 | 79.5 | 2.7 | 76.8 |

**Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Franklin County, Florida the figures in this table only represent information within the Franklin County, Florida.*

*Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.*

- Evidence of actual flood losses can be one of the most compelling factors for increasing a community's flood risk awareness. During this Risk MAP project, FEMA confirmed several areas within this jurisdiction as having mitigation potential and encourages the communities within Franklin County to continue working with the State Hazard Mitigation Officer to further identify and mitigate these high-risk areas and structures. Specific areas within each jurisdiction are detailed within the individual community Area of Mitigation Interest summaries.

- **Coastal Depth and Wave Height Grids**

  The FRD contains datasets in the form of depth grids and wave height grids for all of Franklin County that can be used for additional analysis, enhanced visualization, and communication of flood risks for hazard mitigation planning and emergency management. The data provided within the FRD should be used to further isolate areas where flood mitigation potential is high and may be helpful in planning and implementing mitigation strategies. Section 2 of the FRR provides both general and specific information regarding the development of and potential uses for this data.

| *Coastal Wave Hazard Severity* | *Total Area ($mi^2$)* |
|---|---|
| High | 100.6 |
| Moderate | 60 |
| Minimal | 186.9 |

- **Coastal Increased Inundation Areas**
    - This dataset, stored in the FRD, illustrates the areas that would be exposed to flooding by flood levels that exceed a given flood frequency. The polygons encompass areas that would be flooded by an additional 1, 2, or 3 feet of flooding above the total water level elevation (stillwater plus waves) for the specified flood frequency. The table below summarizes the additional areas that would be inundated and added to the floodplain for each of these scenarios. For each incremental increase, above the flood event, both the newly inundated area and the total inundated area are provided.

| | ***Area of Additional Inundation ($mi^2$)*** | | | | |
|---|---|---|---|---|---|
| ***Flood Event Frequency*** | ***1-ft Increase*** | ***2-ft Increase*** | | ***3-ft Increase*** | |
| | | ***Newly Inundated*** | ***Total*** | ***Newly Inundated*** | ***Total*** |
| 1%-annual-chance | 17.10 | 24.40 | 41.5 | 24.58 | 66.08 |

    - Franklin County's approximately 40 - 50% of major highways within the county are anticipated to experience moderate to severe inundation if an event were to exceed the regulatory special flood hazard area designations. Even if the event does not exceed the regulatory special flood hazard area designations the inundation along roadways is expected to be significant enough to cause road closures or strand motorists. Alternate routes will probably be inundated during these events as well.
    - Critical Facilities: Franklin County has thirty - nine identified critical facilities within the jurisdiction. Fourteen of those facilities are anticipated to be inundated if an event were to exceed the regulatory special flood hazard area designation by one to three feet. These facilities are critical to the economic viability and safety of the residents in the area.

- **Flood Risk Results Information**
    - Franklin County's flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in Franklin County and newly modeled depths for certain flood events. Potential losses were estimated as well as potential loss ratios for multiple scenarios. Scenarios presented reflect storm surge water levels only and are not inclusive of wave heights. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

| | Total Inventory | | Estimated Potential Losses for Flood Event Scenarios | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 10% (10-yr) | | 2% (50-yr) | | 1% (100-yr) | | 0.2% (500-yr) | | Annualized ($/yr) | |
| | Estimated Value | % of Total | Dollar Losses[1] | Loss Ratio[2,6] | Dollar Losses[1] | Loss Ratio[2,6] | Dollar Losses[1] | Loss Ratio[2,6] | Dollar Losses[1] | Loss Ratio[2,6] | Dollar Losses[1] | Loss Ratio[2,6] |
| Residential Building and Contents Losses | $976,900,000 | 71% | $29,900,000 | 4% | $103,200,000 | 11% | $143,300,000 | 15% | $251,100,000 | 26% | $7,700,000 | 1% |
| Commercial Building and Contents Losses | $251,000,000 | 18% | $5,200,000 | 2% | $29,700,000 | 12% | $41,800,000 | 17% | $75,600,000 | 30% | $1,800,000 | 1% |
| Other Building and Contents Losses | $140,500,000 | 10% | $6,700,000 | 6% | $21,800,000 | 16% | $27,500,000 | 20% | $42,600,000 | 30% | $1,400,000 | 1% |
| Total Building and Contents Losses[3] | $1,368,400,000 | 100% | $41,800,000 | 3% | $154,700,000 | 11% | $212,600,000 | 16% | $369,300,000 | 27% | $10,900,000 | 1% |
| Business Disruption[4] | N/A | N/A | $1,600,000 | N/A | $5,200,000 | N/A | $6,600,000 | N/A | $10,200,000 | N/A | $300,000 | N/A |
| **TOTAL[5]** | $1,368,400,000 | 100% | $43,400,000 | 3% | $159,900,000 | 12% | $219,200,000 | 16% | $379,500,000 | 28% | $11,200,000 | 1% |

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total Loss = Total Building and Contents Losses + Business Disruption
[6]Loss Ratio is the weighted average of the Coastal and Riverine Loss Ratios

- **Areas of Mitigation Interest**
  - Section 2.2.5 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

| Type of Mitigation Interest | Number of Areas | Data Source |
|---|---|---|
| Coastal Structures | 3,032 | FL DEP |
| Significant Land Use Changes | 17 | FL DEP |
| Areas of Significant Erosion | 17 | FEMA |
| At Risk Essential Facilities | 71 | FL DEM |
| Other Flood Risk Areas | 1,316 | FL DEP, FDOT |
| Area of Mitigation Success | 1 | FL DEP |

  - Within the Unincorporated Areas of Franklin County 3,032 coastal structures were identified. Of those, 142 were located within the Special Flood Hazard Area. Seventeen areas of significant land use change were identified. Of those, five were located within a Special Flood Hazard Area. Seventy-one essential facilities were identified within the County limits. Of those, more than twenty were located within a Special Flood Hazard Area. 1,316 other flood risk areas were identified. Of those, 216 were located within a Special Flood Hazard Area. These areas of mitigation interest are at the highest risk within the community. Within the City of Apalachicola three essential facilities were identified of which one was located within a Special Flood Hazard Area. Eight other flood risk areas were identified, of which three were located within a Special Flood Hazard Area. These areas of mitigation interest are at the highest risk within the community. Within the City of Carrabelle there is one area of significant land use change which is not located within a Special Flood Hazard Area. Nine at risk essential facilities were identified of which seven were located within a Special Flood Hazard Area. Nine other flood risk areas were identified within the city limit of which four were located within a Special Flood Hazard Area. These areas of mitigation interest are at the highest risk within the community.

## 3.3 Communities

The following sections provide an overview of the community's floodplain management program as of the date of this publication, as well as summarize the flood risk analysis performed for each community in Franklin County, Florida.

### 3.3.1 City of Apalachicola (CID 120089)

The following pages include Flood Risk data for the City of Apalachicola.

*Overview*

The City of Apalachicola is the smallest incorporated city within Franklin County. The information below provides an overview of the City of Apalachicola as of the date of this publication.

| Community Name | CID | Total Community Population | Percent of Population in Floodplain | Total Community Land Area (sq mi) | Percent of Land Area in Floodplain | NFIP | CRS Rating | Mitigation Plan |
|---|---|---|---|---|---|---|---|---|
| City of Apalachicola | 120089 | 2,230 | 71% | 5.9 | 68% | Y | 10 | Y |

- Participating in the Franklin County Florida Local Mitigation Strategy.
- Past Federal Disaster Declarations for flooding = 16
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 240 policies totaling approximately $68,382,300
- NFIP-recognized repetitive loss properties = 2

Data provided below only includes areas within the City of Apalachicola that are located within the project area, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

### 3.3.2 Flood Risk Datasets

As a part of the City of Apalachicola Flood Risk Project, flood risk datasets were created for inclusion in the Flood Risk Database. Those datasets are summarized for the City of Apalachicola below:

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries and flood risk zones within the City of Apalachicola were updated due to new engineering analysis performed within the Flood Risk Project area. The updated modeling produced new flood zone areas and new base flood elevations in some areas and leveraged recently developed LiDAR-based topographic data for the City of Apalachicola. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs and Coastal High Hazard Areas (CHHAs) for the City of Apalachicola.

| Area of Study | Total Area ($mi^2$) | Increase ($mi^2$) | Decrease ($mi^2$) | Net Change ($mi^2$) |
|---|---|---|---|---|
| Within SFHA | 1.4 | 0.1 | 0 | 0.1 |
| Within CHHA (Zone VE or V) | 0.8 | 0.7 | 0.01 | 0.69 |

**Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Franklin County, Florida the figures in this table only represent information within the City of Apalachicola.*

*Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.*

- Evidence of actual flood losses can be one of the most compelling factors for increasing a community's flood risk awareness. During this Risk MAP project, FEMA confirmed several areas within this jurisdiction as having mitigation potential and encourages the City of Apalachicola to continue working with the State Hazard Mitigation Officer to further identify and mitigate these high-risk areas and structures. Specific areas within each jurisdiction are detailed within the individual community Area of Mitigation Interest summaries.

- **Coastal Depth and Wave Height Grids**

  The FRD contains datasets in the form of depth grids and wave height grids for all of the City of Apalachicola that can be used for additional analysis, enhanced visualization, and communication of flood risks for hazard mitigation planning and emergency management. The data provided within the FRD should be used to further isolate areas where flood mitigation potential is high and may be helpful in planning and implementing mitigation strategies. Section 2 of the FRR provides both general and specific information regarding the development of and potential uses for this data.

| Coastal Wave Hazard Severity | Total Area ($mi^2$) |
|---|---|
| High | 0.8 |
| Moderate | 0.3 |
| Minimal | 0.6 |

- **Coastal Increased Inundation Areas**

  - This dataset, stored in the FRD, illustrates the areas that would be exposed to flooding by flood levels that exceed a given flood frequency. The polygons encompass areas that would be flooded by an additional 1, 2, or 3 feet of flooding above the total water level elevation (stillwater plus waves) for the specified flood frequency. The table below summarizes the additional areas that would be inundated and added to the floodplain for each of these

scenarios. For each incremental increase, above the flood event, both the newly inundated area and the total inundated area are provided.

| Flood Event Frequency | *Area of Additional Inundation ($mi^2$)* | | | | |
|---|---|---|---|---|---|
| | **1-ft Increase** | **2-ft Increase** | | **3-ft Increase** | |
| | | **Newly Inundated** | **Total** | **Newly Inundated** | **Total** |
| 1%-annual-chance | .05 | 0.06 | .11 | 0.11 | .22 |

- **Flood Risk Results Information**
  - The City of Apalachicola flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the City of Apalachicola and newly modeled depths for certain flood events. Potential losses were estimated as well as potential loss ratios for multiple scenarios. Scenarios presented reflect storm surge water levels only and are not inclusive of wave heights. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

| | Estimated Potential Losses for Flood Event Scenarios | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Inventory | | 10% (10-yr) | | 2% (50-yr) | | 1% (100-yr) | | 0.2% (500-yr) | | Annualized ($/yr) | |
| | Estimated Value | % of Total | Dollar Losses[1] | Loss Ratio[2,6] | Dollar Losses[1] | Loss Ratio[2,6] | Dollar Losses[1] | Loss Ratio[2,6] | Dollar Losses[1] | Loss Ratio[2,6] | Dollar Losses[1] | Loss Ratio[2,6] |
| Residential Building and Contents Losses | $160,300,000 | 54% | $1,300,000 | 1% | $4,400,000 | 3% | $6,000,000 | 4% | $13,500,000 | 8% | $300,000 | 0.2% |
| Commercial Building and Contents Losses | $77,200,000 | 26% | $1,300,000 | 2% | $5,300,000 | 7% | $7,300,000 | 9% | $13,800,000 | 18% | $400,000 | 1% |
| Other Building and Contents Losses | $58,200,000 | 20% | $4,500,000 | 8% | $10,900,000 | 19% | $12,400,000 | 21% | $17,200,000 | 30% | $800,000 | 1% |
| Total Building and Contents Losses[3] | $295,700,000 | 100% | $7,100,000 | 2% | $20,600,000 | 7% | $25,700,000 | 9% | $44,500,000 | 15% | $1,500,000 | 1% |
| Business Disruption[4] | N/A | N/A | $1,000,000 | N/A | $2,100,000 | N/A | $2,300,000 | N/A | $3,600,000 | N/A | $200,000 | N/A |
| **TOTAL[5]** | $295,700,000 | 100% | $8,100,000 | 3% | $22,700,000 | 8% | $28,000,000 | 9% | $48,100,000 | 16% | $1,700,000 | 1% |

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total Loss = Total Building and Contents Losses + Business Disruption
[6]Loss Ratio is the weighted average of the Coastal and Riverine Loss Ratios

- **Areas of Mitigation Interest**
  - Section 2.2.5 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

| Type of Mitigation Interest | Number of Areas | Data Source |
|---|---|---|
| At Risk Essential Facilities | 3 | FDEM |
| Other Flood Risk Areas | 8 | FDEP |

  - Within the City of Apalachicola three essential facilities were identified of which one was located within a Special Flood Hazard Area. Eight other flood risk areas were identified, of which three were located within a Special Flood Hazard Area. These areas of mitigation interest are at the highest risk within the community. The City would benefit from updating the local mitigation strategy with data from this report.

### 3.3.3 The City of Carrabelle (CID 120090)

*Overview*

The City of Carrabelle is the largest incorporated city within Franklin County. The following pages include Flood Risk data for the City of Carrabelle.

| Community Name | CID | Total Community Population | Percent of Population in Floodplain | Total Community Land Area (sq mi) | Percent of Land Area in Floodplain | NFIP | CRS Rating | Mitigation Plan |
|---|---|---|---|---|---|---|---|---|
| City of Carrabelle | 120090 | 1,351 | 87% | 5.9 | 88% | Y | 10 | Y |

- Participating in the Franklin County Florida Local Mitigation Strategy.
- Past Federal Disaster Declarations for flooding = 16
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 120 policies totaling approximately $24,421,000
- NFIP-recognized repetitive loss properties = 2

Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

### 3.3.4 Flood Risk Datasets

As a part of the City of Carrabelle Flood Risk Project, flood risk datasets were created for inclusion in the Flood Risk Database. Those datasets are summarized for the City of Carrabelle below:

- **Changes Since Last FIRM**
  - Special Flood Hazard Area (SFHA) boundaries and flood risk zones within the City of Carrabelle were updated due to new engineering analysis performed within the Flood Risk Project area. The updated modeling produced new flood zone areas and new base flood elevations in some areas and leveraged recently developed LiDAR-based topographic data for the City of Carrabelle. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs and Coastal High Hazard Areas (CHHAs) for the City of Carrabelle.

| Area of Study | Total Area ($mi^2$) | Increase ($mi^2$) | Decrease ($mi^2$) | Net Change ($mi^2$) |
|---|---|---|---|---|
| Within SFHA | 4.8 | 0.4 | 0.1 | 0.3 |
| Within CHHA (Zone VE or V) | 1.2 | 0.4 | 0.1 | 0.3 |

**Although the Flood Risk Database may contain Changes Since Last FIRM information outside of the City of Carrabelle the figures in this table only represent information within the City of Carrabelle.*

*Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.*

- Evidence of actual flood losses can be one of the most compelling factors for increasing a community's flood risk awareness. During this Risk MAP project, FEMA confirmed several areas within this jurisdiction as having mitigation potential and encourages the communities within the City of Carrabelle to continue working with the State Hazard Mitigation Officer to further identify and mitigate these high-risk areas and structures. Specific areas within each jurisdiction are detailed within the individual community Area of Mitigation Interest summaries.

- **Coastal Depth and Wave Height Grids**

  The FRD contains datasets in the form of depth grids and wave height grids for all of the City of Carrabelle that can be used for additional analysis, enhanced visualization, and communication of flood risks for hazard mitigation planning and emergency management. The data provided within the FRD should be used to further isolate areas where flood mitigation potential is high and may be helpful in planning and implementing mitigation strategies. Section 2 of the FRR provides both general and specific information regarding the development of and potential uses for this data.

| Coastal Wave Hazard Severity | Total Area ($mi^2$) |
|---|---|
| High | 1.2 |
| Moderate | 1 |
| Minimal | 3.1 |

- **Coastal Increased Inundation Areas**

  - This dataset, stored in the FRD, illustrates the areas that would be exposed to flooding by flood levels that exceed a given flood frequency. The polygons encompass areas that would be flooded by an additional 1, 2, or 3 feet of flooding above the total water level elevation (stillwater plus waves) for the specified flood frequency. The table below summarizes the additional areas that would be inundated and added to the floodplain for each of these

scenarios. For each incremental increase, above the flood event, both the newly inundated area and the total inundated area are provided.

| *Flood Event Frequency* | *Area of Additional Inundation ($mi^2$)* | | | | |
|---|---|---|---|---|---|
| | 1-ft Increase | 2-ft Increase | | 3-ft Increase | |
| | | Newly Inundated | Total | Newly Inundated | Total |
| 1%-annual-chance | .42 | .35 | .77 | .32 | 1.09 |

- **Flood Risk Results Information**
  - The City of Carrabelle flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for newly modeled areas the City of Carrabelle and newly modeled depths for certain flood events. Potential losses were estimated as well as potential loss ratios for multiple scenarios. Scenarios presented reflect storm surge water levels only and are not inclusive of wave heights. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

| | Total Inventory | | Estimated Potential Losses for Flood Event Scenarios | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 10% (10-yr) | | 2% (50-yr) | | 1% (100-yr) | | 0.2% (500-yr) | | Annualized ($/yr) | |
| | Estimated Value | % of Total | Dollar Losses[1] | Loss Ratio[2,6] | Dollar Losses[1] | Loss Ratio[2,6] | Dollar Losses[1] | Loss Ratio[2,6] | Dollar Losses[1] | Loss Ratio[2,6] | Dollar Losses[1] | Loss Ratio[2,6] |
| Residential Building and Contents Losses | $89,600,000 | 68% | $1,500,000 | 2% | $4,900,000 | 5% | $7,700,000 | 9% | $16,600,000 | 19% | $400,000 | 0% |
| Commercial Building and Contents Losses | $25,900,000 | 20% | $900,000 | 3% | $3,500,000 | 14% | $5,000,000 | 19% | $8,700,000 | 34% | $200,000 | 1% |
| Other Building and Contents Losses | $16,500,000 | 12% | $200,000 | 1% | $900,000 | 5% | $1,600,000 | 10% | $2,800,000 | 17% | $50,000 | 0% |
| Total Building and Contents Losses[3] | $131,900,000 | 100% | $2,600,000 | 2% | $9,300,000 | 7% | $14,300,000 | 11% | $28,100,000 | 21% | $700,000 | 1% |
| Business Disruption[4] | N/A | N/A | $50,000 | N/A | $200,000 | N/A | $400,000 | N/A | $700,000 | N/A | $10,000 | N/A |
| **TOTAL[5]** | $131,900,000 | 100% | $2,700,000 | 2% | $9,500,000 | 7% | $14,700,000 | 11% | $28,800,000 | 22% | $700,000 | 1% |

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total Loss = Total Building and Contents Losses + Business Disruption
[6]Loss Ratio is the weighted average of the Coastal and Riverine Loss Ratios

- **Areas of Mitigation Interest**
  - Section 2.2.5 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

| Type of Mitigation Interest | Number of Areas | Data Source |
|---|---|---|
| Significant Land Use Changes | 1 | FDEP |
| At Risk Essential Facilities | 9 | FDEP; FDEM |
| Other Flood Risk Areas | 9 | FDEP; FDOT |

  - Within the City of Carrabelle there is one area of significant land use change which is not located within a Special Flood Hazard Area. Nine at risk essential facilities were identified of which seven were located within a Special Flood Hazard Area. Nine other flood risk areas were identified within the city limit of which four were located within a Special Flood Hazard Area. These areas of mitigation interest are at the highest risk within the community. The City would benefit from updating the local mitigation strategy with data from this report.

### 3.3.5 Franklin County Unincorporated Areas (CID 120088)

The following pages include Flood Risk data for the Franklin County Unincorporated Areas.

*Overview*

The information below provides an overview of the Franklin County Unincorporated Areas as of the date of this publication.

| Community Name | CID | Total Community Population | Percent of Population in Floodplain | Total Community Land Area (sq mi) | Percent of Land Area in Floodplain | NFIP | CRS Rating | Mitigation Plan |
|---|---|---|---|---|---|---|---|---|
| Franklin County Unincorporated Areas | 120088 | 8,192 | 82% | 544.6 | 92% | Y | 7 | Y |

- Participating in the Franklin County Florida Local Mitigation Strategy.
- Past Federal Disaster Declarations for flooding = 16
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 2,624 policies totaling approximately ***$***666,321,600
- NFIP-recognized repetitive loss properties = 102

Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

### 3.3.6 Flood Risk Datasets

As a part of Franklin County Unincorporated Areas Flood Risk Project, flood risk datasets were created for inclusion in the Flood Risk Database. Those datasets are summarized for Franklin County Unincorporated Areas below:

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries and flood risk zones within Franklin County Unincorporated Areas were updated due to new engineering analysis performed within the Flood Risk Project area. The updated modeling produced new flood zone areas and new base flood elevations in some areas and leveraged recently developed LiDAR-based topographic data for Franklin County Unincorporated Areas. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs and Coastal High Hazard Areas (CHHAs) for Franklin County Unincorporated Areas.

| Area of Study | Total Area ($mi^2$) | Increase ($mi^2$) | Decrease ($mi^2$) | Net Change ($mi^2$) |
|---|---|---|---|---|
| Within SFHA | 547.1 | 47.5 | 14.2 | 33.3 |
| Within CHHA (Zone VE or V) | 113.7 | 78.4 | 2.6 | 75.8 |

**Although the Flood Risk Database may contain Changes Since Last FIRM information outside of the Unincorporated Areas of Franklin County the figures in this table only represent information within the Unincorporated Areas of Franklin County.*

*Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.*

- Evidence of actual flood losses can be one of the most compelling factors for increasing a community's flood risk awareness. During this Risk MAP project, FEMA confirmed several areas within this jurisdiction as having mitigation potential and encourages Franklin County Unincorporated Area officials to continue working with the State Hazard Mitigation Officer to further identify and mitigate these high-risk areas and structures. Specific areas within each jurisdiction are detailed within the individual community Area of Mitigation Interest summaries.

- **Coastal Depth and Wave Height Grids**

  The FRD contains datasets in the form of depth grids and wave height grids for all of Franklin County Unincorporated Areas that can be used for additional analysis, enhanced visualization, and communication of flood risks for hazard mitigation planning and emergency management. The data provided within the FRD should be used to further isolate areas where flood mitigation potential is high and may be helpful in planning and implementing mitigation strategies. Section 2 of the FRR provides both general and specific information regarding the development of and potential uses for this data.

| Coastal Wave Hazard Severity | Total Area ($mi^2$) |
|---|---|
| High | 98.7 |
| Moderate | 58.8 |
| Minimal | 183.2 |

- **Coastal Increased Inundation Areas**
  - This dataset, stored in the FRD, illustrates the areas that would be exposed to flooding by flood levels that exceed a given flood frequency. The polygons encompass areas that would be flooded by an additional 1, 2, or 3 feet of flooding above the total water level elevation

(stillwater plus waves) for the specified flood frequency. The table below summarizes the additional areas that would be inundated and added to the floodplain for each of these scenarios. For each incremental increase, above the flood event, both the newly inundated area and the total inundated area are provided.

| Flood Event Frequency | Area of Additional Inundation ($mi^2$) | | | | |
|---|---|---|---|---|---|
| | 1-ft Increase | 2-ft Increase | | 3-ft Increase | |
| | | Newly Inundated | Total | Newly Inundated | Total |
| 1%-annual-chance | 17.12 | 22.00 | 39.12 | 24.14 | 63.26 |

- **Flood Risk Results Information**
  - The flood risk analysis in Franklin County Unincorporated Areas incorporates results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Unincorporated Areas of Franklin County and newly modeled depths for certain flood events. Potential losses were estimated as well as potential loss ratios for multiple scenarios. Scenarios presented reflect storm surge water levels only and are not inclusive of wave heights. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

| | Estimated Potential Losses for Flood Event Scenarios | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Inventory | | 10% (10-yr) | | 2% (50-yr) | | 1% (100-yr) | | 0.2% (500-yr) | | Annualized ($/yr) | |
| | Estimated Value | % of Total | Dollar Losses[1] | Loss Ratio[2,6] | Dollar Losses[1] | Loss Ratio[2,6] | Dollar Losses[1] | Loss Ratio[2,6] | Dollar Losses[1] | Loss Ratio[2,6] | Dollar Losses[1] | Loss Ratio[2,6] |
| Residential Building and Contents Losses | $727,000,000 | 77% | $27,100,000 | 4% | $93,900,000 | 13% | $129,600,000 | 18% | $221,000,000 | 30% | $7,000,000 | 1% |
| Commercial Building and Contents Losses | $147,800,000 | 16% | $3,000,000 | 2% | $20,900,000 | 14% | $29,500,000 | 20% | $53,100,000 | 36% | $1,200,000 | 1% |
| Other Building and Contents Losses | $65,800,000 | 7% | $2,000,000 | 3% | $10,000,000 | 15% | $13,500,000 | 21% | $22,600,000 | 34% | $600,000 | 1% |
| Total Building and Contents Losses[3] | $940,600,000 | 100% | $32,100,000 | 3% | $124,800,000 | 13% | $172,600,000 | 18% | $296,700,000 | 32% | $8,800,000 | 1% |
| Business Disruption[4] | N/A | N/A | $500,000 | N/A | $2,900,000 | N/A | $3,900,000 | N/A | $5,900,000 | N/A | $100,000 | N/A |
| **TOTAL[5]** | $940,600,000 | 100% | $32,600,000 | 3% | $127,700,000 | 14% | $176,500,000 | 19% | $302,600,000 | 32% | $8,900,000 | 1% |

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total Loss = Total Building and Contents Losses + Business Disruption
[6]Loss Ratio is the weighted average of the Coastal and Riverine Loss Ratios

- **Areas of Mitigation Interest**
  - Section 2.2.5 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

| Type of Mitigation Interest | Number of Areas | Data Source |
|---|---|---|
| Coastal Structures | 3,032 | FDEP |
| Significant Land Use Changes | 16 | FDEP |
| Areas of Significant Erosion | 17 | FEMA |
| At Risk Essential Facilities | 59 | FDEM; FDEP |
| Other Flood Risk Areas | 1,331 | FDEP; FDOT |
| Area of Mitigation Success | 1 | FDEP |

  - Within the Unincorporated Areas of Franklin County 3,032 coastal structures were identified. Of those, 142 were located within a Special Flood Hazard Area. Sixteen areas of significant land use change were identified. Of those, five were located within a Special Flood Hazard Area. Fifty nine essential facilities were identified within the City limits. Of those, twenty were located within a Special Flood Hazard Area. 1,331 other flood risk areas were identified. Of those, 216 were located within a Special Flood Hazard Area. There is one Area of Mitigation Success and it is also within a Special Flood Hazard Area. These areas of mitigation interest are at the highest risk within the community. The Unincorporated Areas of the county would benefit by combining the data provided in this report with their local mitigation strategy.

# 4 Actions to Reduce Flood Risk

In order to fully leverage the Flood Risk Datasets and Products created for Franklin County, local stakeholders should consider many different flood risk mitigation tactics, including, but not limited the items shown in the sub-sections below. In particular, Franklin County, Georgia's Hazard Mitigation Plan should be consulted to focus on projects that have already been identified for this area.

Building to Prevent Future Loss

The elevated building pictured above withstood Hurricane Katrina.

Communities will need to prioritize projects as part of the planning process. FEMA can then help route federal mitigation dollars to fund these projects.

## 4.1 Types of Mitigation Actions

Mitigation provides a critical foundation on which to reduce loss of life and property by avoiding or lessening the impact of hazard events. This creates safer communities and facilitates resiliency by enabling communities to return to normal function as quickly as possible after a hazard event. Once a community understands its flood risk, it is in a better position to identify potential mitigation actions that can reduce the risk to its people and property.

The mitigation plan requirements in 44 CFR Part 201 encourage communities to understand their vulnerability to hazards and take actions to minimize vulnerability and promote resilience. Flood mitigation actions generally fall into the following categories:

### 4.1.1 Preventative Measures

Preventative measures are intended to keep flood hazards from getting worse. They can reduce future vulnerability to flooding, especially in areas where development has not yet occurred or where capital improvements have not been substantial. Examples include:

- Comprehensive land use planning
- Zoning regulations
- Subdivision regulations
- Open space preservation
- Building codes
- Floodplain development regulations
- Stormwater management
- Purchase development rights or conservation easements
- Participation in the NFIP Community Rating System (CRS)

NFIP's CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from community actions meeting the three goals of the CRS: to reduce flood losses, to facilitate accurate insurance rating, and to promote the awareness of flood insurance.

For CRS participating communities, flood insurance premium rates are discounted in increments of 5%; i.e., a Class 1 community would receive a 45% premium discount, while a Class 9 community would receive a 5% discount. (A Class 10 is not participating in the CRS and receives no discount.)

### 4.1.2 Property Protection Measures

Property protection measures protect existing buildings by modifying the building to withstand floods, or by removing buildings from hazardous locations. Examples include:

- Building relocation
- Acquisition and clearance
- Building elevation
- Barrier installation
- Building retrofit

### 4.1.3 Natural Resource Protection Activities

Natural resource protection activities reduce the impact of floods by preserving or restoring natural areas such as floodplains, wetlands, and dunes and their natural functions. Examples include:

- Wetland protection
- Living shorelines
- Habitat protection
- Erosion and sedimentation control
- Beach nourishment
- Primary frontal dune protection

### 4.1.4 Structural Mitigation Projects

Structural mitigation projects lessen the impact of floods by modifying the environmental natural progression of the flooding event. Structural protection such as upgrading dams/levees for already existing development and critical facilities may be a realistic alternative. However, citizens should be made aware of their residual risk. Examples include:

- Reservoirs, retention, and detention basins
- Levees, floodwalls, and coastal shoreline protection structures

### 4.1.5 Public Education and Awareness Activities

Public education and awareness activities advise residents, business owners, potential property buyers, and visitors about floods, hazardous areas, and mitigation techniques they can use to reduce the flood risk to themselves and their property. Examples include:

- Readily available and readable updated maps
- Outreach projects
- Libraries
- Technical assistance
- Real estate disclosure
- Environmental education

For more information regarding hazard mitigation techniques, best practices, and potential grant funding sources, visit www.fema.gov or contact your local floodplain manager, emergency manager, or State Hazard Mitigation Officer.

- Risk information via the nightly news

### 4.1.6 Emergency Service Measures

Although not typically considered a mitigation technique, emergency service measures minimize the impact of flooding on people and property. These are actions commonly taken immediately prior to, during, or in response to a hazard event. Examples include:

- Hazard warning system
- Emergency response plan
- COOP and COG planning
- Critical facilities protection
- Health and safety maintenance
- Post flood recovery planning

In Section 3, specific AoMIs were identified. Table 4.1 below identifies possible mitigation actions for each AoMI to consider.

**Table 4-1. Mitigation Actions for Areas of Mitigation Interest**

| *AoMI* | *Possible Actions to Reduce Flood Risk* |
|---|---|
| *Levees (accredited and non-accredited) and significant levee-like structures* | *Engineering Assessment*<br>*Levee upgrades and strengthening*<br>*Emergency Action Plan*<br>*Purchase of flood insurance for at-risk structures* |
| *Coastal Structures*<br>*Jetties*<br>*Groins*<br>*Seawalls*<br>*Other structures* | *Engineering assessment*<br>*Structural upgrades and strengthening*<br>*Beach nourishment and dune construction*<br>*Increase coastal setbacks for construction* |
| *Natural Resource Protection*<br>*Living Shorelines*<br>*Wetland Protection/Restoration* | *Wetland restoration and mitigation banking programs*<br>*Habitat restoration programs*<br>*Living shoreline engineering design and construction* |
| *Major Land Use Changes (past 5 years or next 5 years)* | *Higher regulatory standard*<br>*Transfer of Development rights* |
| *Key Emergency Routes Overtopped During Frequent Flooding Events* | *Elevation*<br>*Creation of alternate routes* |
| *Areas of Significant Coastal Erosion* | *Relocation of buildings and infrastructure*<br>*Regulations and planning*<br>*Natural vegetation*<br>*Increase coastal setbacks for construction*<br>*Beach nourishment and dune construction*<br>*Dune grass planting, dune walkovers, and other protective measures*<br>*Coastal armoring or stabilization structures* |
| *At Risk Essential Facilities* | *Relocation of buildings and infrastructure*<br>*Elevation* |

| *AoMI* | *Possible Actions to Reduce Flood Risk* |
|---|---|
| *Areas of Mitigation Success* | *Promoting successes to encourage future actions* |

## 4.2 Identifying Specific Actions for Your Community

As many mitigation actions are possible to lessen the impact of floods, how can a community decide which ones are appropriate to implement? There are many ways to identify specific actions most appropriate for a community. Some factors to consider may include the following:

Refer to FEMA Mitigation Planning How To Guide #3 (FEMA 386-3) "Developing the Mitigation Plan - Identifying Mitigation Actions and Implementation Strategies" for more information on how to identify specific mitigation actions to address hazard risk in your community.

- **Site characteristics.** Does the site present unique challenges (e.g., significant slopes or erosion potential)? Review the Primary Frontal Dune (PFD) Erosion Areas data in the Flood Risk Database to see areas with retreat or removal potential. These areas may be good candidates for beach nourishment or dune construction.
- **Flood characteristics.** Are the flood waters affecting the site fast or slow moving? Is there debris associated with the flow? How deep is the flooding? Review the 1%-annual-chance depth grid in the Flood Risk Database to see the depth of flooding. Review the Coastal Wave Height Grid to see a detailed analysis of the wave heights associated with the 1%-annual-chance flood event or the Coastal Wave Hazard Severity Areas to see which areas in Franklin County are likely to experience wave hazards. Review the Limit of Moderate Wave Action (LiMWA) on the FIRM to see areas where potentially damaging waves can occur in the Coastal A Zone. Structural retrofits or elevation may be potential mitigation solutions for areas with high wave hazard risks.
- **Social acceptance.** Will the mitigation action be acceptable to the public? Does it cause social or cultural problems? Talk to FEMA's outreach specialists for a tailored outreach plan for Franklin County. Use the Flood Risk Database to "show" the public the potential risks for a particular area.
- **Technical feasibility.** Is the mitigation action technically feasible (e.g., making a building watertight to a reasonable depth)? Work with engineers or other certified professionals when designing mitigation activities.
- **Administrative feasibility.** Is there administrative capability to implement the mitigation action? Review Franklin County's Hazard Mitigation Plan to see which specific mitigation projects already receive administrative support. Use the Flood Risk Database to match planned mitigation projects with the highest risk areas to help prioritize future projects.
- **Legal.** Does the mitigation action meet all applicable codes, regulations, and laws? Public officials may have a legal responsibility to act and inform citizens if a known hazard has been identified.

FEMA in collaboration with the American Planning Association has released the publication, "Integrating Hazard Mitigation into Local Planning." This guide explains how hazard mitigation can be incorporated into several different types of local planning programs. For more information go to www.planning.org. or http://www.fema.gov/library.

- **Economic.** Is the mitigation action affordable? Is it eligible under grant or other funding programs? Can it be completed within existing budgets?
- **Environmental.** Does the mitigation action cause adverse impacts on the environment or can they be mitigated? Is it the most appropriate action among the possible alternatives?

Franklin County local Hazard Mitigation Plan is a valuable place to identify and prioritize possible mitigation actions. The plan includes a mitigation strategy with mitigation actions that were developed through a public and open process. You can then add to or modify those actions based on what is learned during the course of the Risk MAP project and the information provided within this FRR.

Also review the Flood Risk Database products to see areas with a high risk such as areas with Primary Frontal Dune (PFD) erosion potential or high wave height potential. The Coastal Increased Inundation Areas product can help for planning for the future or for more extreme scenarios. These products can help the community understand which areas have a higher risk, allowing Franklin County to focus resources on these areas.

## 4.3 Mitigation Programs and Assistance

Not all mitigation activities require funding (e.g., local policy actions such as strengthening a flood damage prevention ordinance), and those that do are not limited to outside funding sources (e.g., inclusion in local capital improvements plan, etc.). For those mitigation actions that require assistance through funding or technical expertise, several state and federal agencies have flood hazard mitigation grant programs and offer technical assistance. These programs may be funded at different levels over time or may be activated under special circumstances such as after a presidential disaster declaration.


Communities can link hazard mitigation plans and actions to the right FEMA grant programs to fund flood risk reduction. More information about FEMA HMA programs can be found at http://www.fema.gov/government/grant/hma/index.shtm.

### 4.3.1 FEMA Mitigation Programs and Assistance

FEMA awards many mitigation grants each year to states and communities to undertake mitigation projects to prevent future loss of life and property resulting from hazard impacts, including flooding. The FEMA Hazard Mitigation Assistance (HMA) programs provide grants for mitigation through the programs listed in Table 4.2 below.

**Table 4-2. FEMA Hazard Mitigation Assistance Programs**

| Mitigation Grant Program | Authorization | Purpose |
|---|---|---|
| Hazard Mitigation Grant Program (HMGP) | Robert T. Stafford Disaster Relief and Emergency Assistance Act | Activated after a presidential disaster declaration; provides funds on a sliding scale formula based on a percentage of the total federal assistance for a disaster for long-term mitigation measures to reduce vulnerability to natural hazards |
| Flood Mitigation Assistance (FMA) | National Flood Insurance Reform Act | Reduce or eliminate claims against the NFIP |
| Pre-Disaster Mitigation (PDM) | Disaster Mitigation Act | National competitive program focused on mitigation project and planning activities that address multiple natural hazards |

| Mitigation Grant Program | Authorization | Purpose |
|---|---|---|
| Repetitive Flood Claims (RFC) | Bunning-Bereuter-Blumenauer Flood Insurance Reform Act | Reduce flood claims against the NFIP through flood mitigation; properties must be currently NFIP insured and have had at least one NFIP claim |
| Severe Repetitive Loss (SRL) | Bunning-Bereuter-Blumenauer Flood Insurance Reform Act | Reduce or eliminate the long-term risk of flood damage to SRL residential structures currently insured under the NFIP |

The HMGP and PDM programs offer funding for mitigation planning and project activities that address multiple natural hazard events. The FMA, RFC, and SRL programs focus funding efforts on reducing claims against the NFIP. Funding under the HMA programs is subject to availability of annual appropriations, and HMGP funding is also subject to the amount of FEMA disaster recovery assistance provided under a presidential major disaster declaration.

FEMA's HMA grants are awarded to eligible states, tribes, and territories (applicant) that, in turn, provide sub-grants to local governments and communities (sub-applicant). The applicant selects and prioritizes sub-applications developed and submitted to them by sub-applicants and submits them to FEMA for funding consideration. Prospective sub-applicants should consult the office designated as their applicant for further information regarding specific program and application requirements. Contact information for the FEMA Regional Offices and State Hazard Mitigation Officers (SHMO) is available on the FEMA website (http://www.fema.gov/region-iv-al-fl-ga-ky-ms-nc-sc-tn) and the GEMA website (www.gema.ga.gov).

### 4.3.2 Additional Mitigation Programs and Assistance

Several additional agencies including USACE, NOAA, Natural Resource Conservation Service (NRCS), U.S. Geological Survey (USGS), and others have specialists on staff and can offer further information on flood hazard mitigation. The State NFIP Coordinator and SHMO are state-level sources of information and assistance, which vary among different states.

The Silver Jackets program, active in several states, is a partnership of USACE, FEMA, and state agencies. The Silver Jackets program provides a state-based strategy for an interagency approach to planning and implementing measures for risk reduction.

# 5 Acronyms and Definitions

## 5.1 Acronyms

**A**

| | |
|---|---|
| AAL | Average Annualized Loss |
| ALR | Annualized Loss Ratio |
| *AoMI* | *Areas of Mitigation Interest* |

**B**

| | |
|---|---|
| BCA | Benefit-Cost Analysis |
| BFE | Base Flood Elevation |
| BMP | Best Management Practices |

**C**

| | |
|---|---|
| CFR | Code of Federal Regulations |
| CHHA | Coastal High Hazard Areas |
| COG | Continuity of Government Plan |
| COOP | Continuity of Operations Plan |
| CRS | Community Rating System |
| CSLF | Changes Since Last FIRM |

**D**

| | |
|---|---|
| DHS | Department of Homeland Security |
| DMA 2000 | Disaster Mitigation Act of 2000 |

**E**

| | |
|---|---|
| EAP | Emergency Action Plan |
| EOP | Emergency Operations Plan |

**F**

| | |
|---|---|
| FEMA | Federal Emergency Management Agency |
| FIRM | Flood Insurance Rate Map |
| FIS | Flood Insurance Study |
| FMA | Flood Mitigation Assistance |
| FRD | Flood Risk Database |
| FRM | Flood Risk Map |
| FRR | Flood Risk Report |
| FY | Fiscal Year |

**G**

| | |
|---|---|
| GIS | Geographic Information System |

**H**

| | |
|---|---|
| HMA | Hazard Mitigation Assistance |
| HMGP | Hazard Mitigation Grant Program |

**I**

| | |
|---|---|
| IA | Individual Assistance |

**N**

| | |
|---|---|
| NFIA | National Flood Insurance Act |
| NFIP | National Flood Insurance Program |
| NRCS | Natural Resource Conservation Service |

**P**

| | |
|---|---|
| PA | Public Assistance |
| PDM | Pre-Disaster Mitigation |
| PFD | Primary Frontal Dune |
| PMF | Probable Maximum Flood |

**R**

| | |
|---|---|
| RFC | Repetitive Flood Claims |
| Risk MAP | Mapping, Assessment, and Planning |

**S**

| | |
|---|---|
| SFHA | Special Flood Hazard Area |
| SHMO | State Hazard Mitigation Officer |
| SRL | Severe Repetitive Loss |

**U**

| | |
|---|---|
| USACE | U.S. Army Corps of Engineers |
| USGS | U.S. Geological Survey |

## 5.2 Definitions

**0.2-percent-annual-chance flood** – The flood elevation that has a 0.2-percent chance of being equaled or exceeded each year. Sometimes referred to as the 500-year flood.

**1-percent-annual-chance flood** – The flood elevation that has a 1-percent chance of being equaled or exceeded each year. Sometimes referred to as the 100-year flood.

**Annualized Loss Ratio (ALR)** – Expresses the annualized loss as a fraction of the value of the local inventory (total value/annualized loss).

**Average Annualized Loss (AAL)** – The estimated long-term weighted average value of losses to property in any single year in a specified geographic area.

**Base Flood Elevation (BFE)** – Elevation of the 1-percent-annual-chance flood. This elevation is the basis of the insurance and floodplain management requirements of the NFIP.

**Berm –** A small levee, typically built from earth.

**Cfs** – Cubic feet per second, the unit by which discharges are measured (a cubic foot of water is about 7.5 gallons).

**Coastal High Hazard Area (CHHA)**—Portion of the SFHA extending from offshore to the inland limit of a primary frontal dune along an open coast or any other area subject to high velocity wave action from storms or seismic sources.

**Consequence (of flood)** – The estimated damages associated with a given flood occurrence.

**Crest** – The peak stage or elevation reached or expected to be reached by the floodwaters of a specific flood at a given location.

**Dam** – An artificial barrier that has the ability to impound water, wastewater, or any liquid-borne material, for the purpose of storage or control of water.

**Design flood event** – The greater of the following two flood events: (1) the base flood, affecting those areas identified as SFHAs on a community's FIRM; or (2) the flood corresponding to the area designated as a flood hazard area on a community's flood hazard map or otherwise legally designated.

**Erosion** – Process by which floodwaters lower the ground surface in an area by removing upper layers of soil.

**Essential facilities** – Facilities that, if damaged, would present an immediate threat to life, public health, and safety. As categorized in Hazus, essential facilities include hospitals, emergency operations centers, police stations, fire stations, and schools.

**Flood** – A general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of inland or tidal waters or (2) the unusual and rapid accumulation or runoff of surface waters from any source.

**Flood Insurance Rate Map (FIRM)** – An official map of a community, on which FEMA has delineated both the SFHAs and the risk premium zones applicable to the community. See also Digital Flood Insurance Rate Map.

**Flood Insurance Study (FIS) Report** – Contains an examination, evaluation, and determination of the flood hazards of a community, and if appropriate, the corresponding water-surface elevations.

**Flood risk** – Probability multiplied by consequence; the degree of probability that a loss or injury may occur as a result of flooding. This is sometimes referred to as flood vulnerability.

**Flood vulnerability** – Probability multiplied by consequence; the degree of probability that a loss or injury may occur as a result of flooding. This is sometimes referred to as flood risk.

**Flood-borne debris impact** – Floodwater moving at a moderate or high velocity can carry flood-borne debris that can impact buildings and damage walls and foundations.

**Floodwall** – A long, narrow concrete or masonry wall built to protect land from flooding.

**Floodway (regulatory)** – The channel of a river or other watercourse and that portion of the adjacent floodplain that must remain unobstructed to permit passage of the base flood without cumulatively increasing the water surface elevation more than a designated height (usually 1 foot).
**Floodway fringe** – The portion of the SFHA that is outside of the floodway.

**Freeboard** – A factor of safety usually expressed in feet above a flood level for purposes of flood plain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed (44CFR§59.1).

**Hazus** – A GIS-based risk assessment methodology and software application created by FEMA and the National Institute of Building Sciences for analyzing potential losses from floods, hurricane winds and storm surge, and earthquakes.

**High velocity flow** – Typically comprised of floodwaters moving faster than 5 feet per second.

**Levee** – A human-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding. (44CFR§59.1)

**Loss ratio** – Expresses loss as a fraction of the value of the local inventory (total value/loss).

**Mudflow** – Mudslide (i.e., mudflow) describes a condition where there is a river, flow or inundation of liquid mud down a hillside usually as a result of a dual condition of loss of brush cover, and the subsequent accumulation of water on the ground preceded by a period of unusually heavy or sustained rain. A mudslide (i.e., mudflow) may occur as a distinct phenomenon while a landslide is in progress, and will be recognized as such by the Administrator only if the mudflow, and not the landslide, is the proximate cause of damage that occurs. (44CFR§59.1)

**Primary frontal dune (PFD)**—A continuous or nearly continuous mound or ridge of sand with relatively steep seaward and landward slopes immediately landward and adjacent to the beach and subject to erosion and overtopping from high tides and waves during major coastal storms. The inland limit of the primary frontal dune occurs at the point where there is a distinct change from a relatively steep slope to a relatively mild slope.

**Probability (of flood)** – The likelihood that a flood will occur in a given area.

**Risk MAP** – Risk Mapping, Assessment, and Planning, a FEMA strategy to work collaboratively with state, local, and tribal entities to deliver quality flood data that increases public awareness and leads to action that reduces risk to life and property.

**Riverine** – Of or produced by a river. Riverine floodplains have readily identifiable channels.

**Special Flood Hazard Area (SFHA)** – Portion of the floodplain subject to inundation by the 1-percent-annual or base flood.

**Stafford Act** – Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-707, signed into law November 23, 1988; amended the Disaster Relief Act of 1974, PL 93-288. This Act constitutes the statutory authority for most federal disaster response activities especially as they pertain to FEMA and FEMA programs.

**Stillwater** –Projected elevation that flood waters would assume, referenced to National Geodetic Vertical Datum of 1929, North American Vertical Datum of 1988, or other datum, in the absence of waves resulting from wind or seismic effects.

**Stream Flow Constrictions** – A point where a human-made structure constricts the flow of a river or stream.

# 6 Additional Resources

**ASCE 7** – National design standard issued by the American Society of Civil Engineers (ASCE), *Minimum Design Loads for Buildings and Other Structures*, which gives current requirements for dead, live, soil, flood, wind, snow, rain, ice, and earthquake loads, and their combinations, suitable for inclusion in building codes and other documents.

**ASCE 24-05** – National design standard issued by the ASCE, *Flood Resistant Design and Construction*, which outlines the requirements for flood resistant design and construction of structures in flood hazard areas.

National Flood Insurance Program (NFIP), Federal Emergency Management Agency (FEMA), www.floodsmart.gov

FEMA, www.fema.gov

ASCE, 2010. *So, You Live Behind a Levee!* Reston, VA.

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*USGS National Assessment of Shoreline Change Project. http://coastal.er.usgs.gov/shoreline-change/*

# 7 Data Used to Develop Flood Risk Products

GIS base map information was acquired from the following sources:

- Northwest Florida Water Management District
- Jefferson County, Florida
- HAZUS
- FEMA
- USGS
- Florida Department of Emergency Management
- Florida Department of Environmental Protection
- Florida Department of Transportation

Engineering study information was leveraged from the USGS with coordination from the Northwest Florida Water Management District, Jefferson County and FEMA. Mitigation Plans and Areas of Mitigation Interest information were acquired from local community input as well as significant input from the State of Florida Division of Emergency Management and the Florida Department of Environmental Protection.