HERNANDO COUNTY LOCAL MITIGATION STRATEGY

2025 Update

ABSTRACT

Hernando County is vulnerable to large scale hazards and the Local Mitigation Strategy is based in the need to lessen the human, economic, and environmental costs of disasters resulting from these hazards.

Developed by the Hernando County Local Mitigation Strategy Working Group in Partnership with the Tampa Bay Regional Planning Council

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1.0 Introduction

1.1 Purpose of Local Mitigation Strategy

Hazard Mitigation is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards. The Local Mitigation Strategy (LMS) offers innovative approaches for combining funds and coordinating government leadership with the private sector. It is an opportunity for each sector of our community to plan for a safer future. Through these efforts, it is a valuable avenue to reduce risks from disasters. Mitigation has become a cornerstone to emergency management. Mitigation activities may be implemented prior to, during or after an incident. However, it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs. In response to the unacceptable loss of life and property from recent disasters, and the prospect of even greater catastrophic loss in the future, the Local Mitigation Strategy has been developed to provide a conceptual framework to reduce these losses by breaking the cycle of "disaster event-rebuilding-disaster."

The LMS also identifies goals and activities for mitigating hazards and provides a cycle for reviewing and updating the plan. The LMS enables local, State, and Federal agencies to better coordinate overall hazard reduction programs, grants, and policies.

In compliance with the requirements of the DMA of 2000, the LMS includes documentation of the process used to develop and update the plan, including how it was prepared, who was involved, and how the public was involved. In accordance with FEMA guidance, the LMS includes a risk assessment that identifies the hazards that can affect the County and the incorporated community of the City of Brooksville. Hernando County and its municipalities developed a unified Local Mitigation Strategy during the late nineties. By developing the Local Mitigation Strategy, Hernando County can increase the resiliency of the community to the disruption and hardship of disasters and attempt to reduce the potential and actual costs of their impact. The cost of recovery and rebuilding due to the devastation caused by a natural disaster is much greater than the cost of planning and preparing before disaster strikes.

Updating the LMS for adoption in 2025 involved a process whereby the vulnerability and risk to all identified natural and manmade hazards were assessed for the county and its two municipalities; plans, programs and projects to lessen the effects of disasters were identified. This risk analysis included four main components: hazard identification, profiling hazard events, asset inventory, and estimation of potential loss. The methodology and focus areas used to conduct this analysis are described in the Hazard Identification and Risk Assessment section of this plan. The Bureau of Economic and Business Research at the University of Florida projects that the population of Hernando County will grow to 246,899 by 2045.[1] A summary as it pertains to future land use and development trends can be found in Section 1.2.7, Development Trends.

An updated Local Mitigation Strategy reduces the local government's required cost sharing ratio necessary for obtaining certain types of post-disaster grant funding, streamlines the receipt process for post-disaster state and federal funding through the pre-identification of mitigation initiatives, supporting more effective pre- and post-disaster decision making efforts, lessening each community's vulnerability to disasters by focusing limited financial resources to ranked initiatives.

[1] https://www.bebr.ufl.edu/sites/default/files/Research%20Reports/projections_2019_asrh.pdf

1.2 Community Profile

Hernando County was established in 1843 and named in honor of Hernando Desoto, a Spanish explorer. One of the principal settlements by the early 1850's was Bayport, a community that exported cotton, farm produce, and timber. In 1856 the present county seat of Brooksville was established in honor of Representative Preston Brooks.

1.2.1 Natural Features

Approximately 30% of the land is in conservation including the Withlacoochee State Forest, the Weeki Wachee Preserve, and the Chassahowitzka National Wildlife Refuge. Weeki Wachee Springs State Park includes a first magnitude spring meaning an upwelling of at least 100 cubic feet per second.

Moving west to east, the landforms include coastal swamps, well-drained sand hills, the heavily forested Brooksville Ridge, additional sand hills, and the floodplain of the Withlacoochee River system. The principal source of drinking water is the porous, honeycombed limestone of the Floridan Aquifer.

1.2.2 Temperature and Climate

The average temperature in Hernando County in January is 59.8 degrees Fahrenheit. In August the average temperature is 81 degrees. The approximate elevation of Hernando County is 175ft above sea level, and the average annual rainfall is 60.1 inches.[2]

1.2.3 Political Boundaries

Hernando County is located in the geographic center of Florida. The county is within Florida's Nature Coast and encompasses approximately 506 square miles, including the City of Brooksville (the County Seat).

[2] http://hernandochamber.com/pages/demographics

Census Designated Places with high proportions of population include unincorporated areas Spring Hill, North Weeki Wachee, Timber Pines, Ridge Manor, Brookridge, South Brooksville, High Point, North Brooksville, and Hernando Beach. The county stretches 37 miles from east to west and 18 miles from north to south and is bordered by the Gulf of Mexico on the west and the Withlacoochee and Little Withlacoochee Rivers on the east.

1.2.4 Population

According to the Bureau of Economic and Business Research (BEBR) at the University of Florida the estimated 2025 population for the entire county was 205,786, up approximately 9.80% from the 2020 level of 185,604. The City of Brooksville saw a population increase of 8.84 percent between 2020 and 2024.[3]

Table 1-1 – Hernando County Population

	April 1, 2020 Census	Total Change 2018 - 2025	April 1, 2025 Estimate*	Percent Change
Hernando County	185,604	20,182	205,786	9.80
Brooksville	8,890	862	9,752	8.84
Weeki Wachee	16	-16	0	0
Unincorporated	185,609	15,216	200,825	7.58
*Population Estimates from University of Florida, BEBR, 2024				

According to the 2023 American Community Survey 5-year estimates, the median household income was $63,193. This lags behind the statewide level of $73,311. 12 percent of the population is in poverty as compared to 12.3 percent statewide. The population of Hernando County is 76.7 percent white. Of a total population in the county, 3.8 percent of residents are Black or African American and 17.8 percent are Hispanic or Latino. The average age according to ACS data is 47.4, and 26.3 percent of the county's population is over 65 years of age.[4]

1.2.5 Transportation

Five major highways criss-cross Hernando County. North-south routes include Interstate 75, U.S. 19, the Suncoast Parkway, U.S. 98 and U.S. 41. The latter two run adjacent to the Brooksville-Tampa Bay Regional Airport and Technology Center. I-75 is east of Brooksville and connects via the major east-west artery, State Road 50.

The Brooksville-Tampa Bay Regional Airport and Technology Center has two active air traffic-controlled runways (7,000 and 5,000 feet) and a 2400-acre technology center ready for your business expansion or relocation. Tampa International Airport is a 40-minute drive from central Hernando County, and Orlando International Airport is 75 minutes away.[5]

[3] https://bebr.ufl.edu/florida-estimates-of-population-2024/

[4] https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml

[5] http://www.hernandobusiness.com/p/14524/geography

1.2.6 Economy

The workforce for Hernando County is 37 percent of the County population age 16 or older, according to December 2024 Federal Reserve of St. Louis estimates. The largest industry sector was Healthcare and Social Assistance with 683 establishments and 9,548 employees, according to the 2024 Esri estimates based on the U.S. Census and population projections.[6] The second largest business sector was Retail Trade with 834 establishments and 8,674 employees. The second largest business sector was Retail Trade with 834 establishments and 8,674 employees. According to the Greater Hernando County Chamber of Commerce, the largest employer is Hernando County Schools with over 3,000 employees. The largest private sector retail employer is Wal-Mart, and the largest private sector non-retail employer is the Oak Hill Hospital. [7]

The annual average unemployment rate for 2018 in Florida was 3.4 percent. In Hernando County the annual average unemployment rate for 2024 was 4.2 percent, which has been rising since an April 2023 low of 3.1 percent.[8]

1.2.7 Development Trends

Hernando County was historically a rural county which has developed a dual character with both suburban and rural characteristics. As described in Section 1.2.4, Hernando County has seen a 7.4% increase in population since 2010. Approximately 80% of the population is in the urbanized area of Spring Hill/Brooksville. The breakdown of land use indicates that 30% of the land area is used for conservation purposes, and 24 % is used for agriculture.

Figure 1-2 – Hernando County Existing Land Use[9]

Existing Land Use	Acres	Percentage of Total
Agriculture	79,199	24.4%
Commercial	2,146	0.7%
Conservation	97,626	30.1%
Education	1,187	0.4%
Industrial	836	0.3%
Mining	6,314	1.9%
Mobile Homes	14,192	4.4%
Multi-Family	569	0.2%

Existing Land Use	Acres	Percentage of Total
Private Institutional	2,554	0.8%
Publicly Owned	4,325	1.3%
Recreation	6,965	2.1%
Right of Way	16,643	5.1%
Single Family	39,010	12.0%
Utilities	1,918	0.6%
Vacant	35,139	10.8%
Water/Wetlands	15,338	4.7%
Totals	**323,961**	**100%**

Hernando County is a community that has experienced the boom and bust of growth cycles before. The rapid development of Pasco County to the south indicates that Hernando County is on the threshold of another upswing in growth. Over the next 20 years, expanded regional transportation options coupled with desirability as a place to live and work will lead to growth. The challenge for community leaders, the business community and elected officials will be to accommodate growth without compromising the natural assets and characteristics that make people want to call Hernando County home.

Regionalization pressures will continue to shape decisions on issues important to Hernando County such as transportation, groundwater and economic development. The current residential population center, Spring

[6] https://www.census.gov/quickfacts/fact/table/hernandocountyflorida/PST045223

[7] http://hernandochamber.com/pages/demographics

[8] Florida Department of Economic Opportunity, Local Area Unemployment Statistics (LAUS) for Hernando County, http://www.floridajobs.org/workforce-statistics/data-center/statistical-programs/local-area-unemployment-statistics

[9] Hernando County Comprehensive Plan, Future Land Use Element, Amended 2021

Hill is aging and becoming more diverse. Meanwhile over 61,000 approved residential units yet to be built have the potential to redefine the County's future population centers. Transportation infrastructure will change with expanded regional access via State Road 50 and the Suncoast Parkway, transportation technology advances that will affect mobility, and expanded use of travel modes outside traditional automobiles. The economic recovery will renew potential development pressures on and near the County's rural, conservation and farming areas. Agriculture has been trending towards numerous smaller farms with a diverse suite of new products, while existing mining lands will approach depletion placing emphasis on finding opportunities for reuse of the land.[10]

As development pressure increases planners, county engineers, and elected officials will need to be vigilant to balance the desire for more housing and job centers with the preservation of natural resources, especially those that mitigate flood risk. While redevelopment is not common in Hernando County, it could become more frequent in future years. As always, all future development proposals will be considered against the goals of the Comprehensive Plan and the regulations of the Land Development Code, both of which prioritize protection of the watershed and natural resource areas.

2.0 Planning Process

This section documents the process used to develop the strategy, how it was prepared, who was involved in the process, and how the public was involved.

2.1 Strategy Preparation and Organization

The Hernando County Department of Emergency Management entered into a professional services agreement with the Tampa Bay Regional Planning Council, to facilitate the 2025 update to the LMS. A planning committee was formed to complete the update, and the planning process was conducted under the supervision of the Local Mitigation Strategy's Planning Committee ("LMS Planning Committee") and designated County staff.

Each jurisdiction in Hernando County is represented on the LMS Planning Committee. The LMS Working Group composition and member responsibilities are listed below. Meeting minutes, sign-in sheets and associated materials, are contained in Appendix B.

The municipal jurisdictions covered under this plan include the City of Brooksville. Weeki Wachee, formerly the City of Weeki Wachee, is now part of unincorporated Hernando County. There are no other jurisdictions in Hernando County.

This process also adhered to guidelines of the National Flood Insurance Program's Community Rating System by including staff responsible for land use and zoning, construction permitting and related code enforcement, floodplain management and mitigation, flood insurance education and other outreach topics. The Hernando County LMS Planning Committee members are listed in Table 2-1. The working group includes local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development, as well as other interested parties. All members were notified by email of upcoming meetings.

[10] Hernando County Comprehensive Plan, Plan Introduction and Executive Summary 2021

Table 2-1 – Hernando County LMS Planning Committee

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2.2 Public Involvement

In compliance with DMA 2000 requirements, public participation was encouraged throughout the mitigation planning process. The public involvement component of all LMS updates included accessibility to duly advertised public meetings, participation in the mitigation planning process, and feedback on recommended strategies and the draft plan. Public involvement on the Hernando County Local Mitigation Strategy was accomplished in the following manner:

- All LMS Planning Committee meetings have been open public meetings and advertised in the local newspaper. A link to the TBRPC website was placed on the County website.
- A public workshop was held within 60 days of the first 5-year update planning meeting to seek input on the hazard.
- A public workshop was held to review the draft document prior to approval by the governing body.
- All members of the public and other interested parties that have attended the meetings and/or expressed an interest in the program have received copies of all information either in hard copy or via the internet.
- The final plan will be made available for public review and comment before the plan is adopted by all jurisdictions.

Appendix B includes public meeting notices, and LMS planning meeting materials.

2.3 Coordination with other Agencies

Emails encouraging comments on the plan were sent to applicable agencies who are participants in the LMS Planning Committee.

The planning process included a review of goals, objectives and policies contained in County and municipal comprehensive plans. Also reviewed were the Hernando County Comprehensive Emergency Management Plan and the State of Florida Enhanced Hazard Mitigation Plan.

A wide range of agencies actively participated in the LMS update. The Florida Forestry Services was heavily involved in the 2025 update of the Local Mitigation Strategy in an effort to update the integrated Community Wildfire Protection Plan. Additionally, the Tampa Bay Regional Planning Council provided subject matter expertise on updating and incorporating considerations for climate resiliency as part of the established Tampa Bay Regional Resiliency Coalition of which Hernando County is a member. Additionally, neighboring jurisdictions provided support and knowledge sharing facilitated by the Tampa Bay Regional Planning Council.

Planning Process

The LMS Planning Committee represents all the local jurisdictions and key organizations participating in the planning process. The LMS Planning Committee was also responsible for reviewing the strategy's goals and objectives, revising them as necessary, reviewing the technical analysis and planning activities of the plan, approving proposed mitigation initiatives for incorporation into the plan, determining the priorities for implementation of those initiatives, and for removing or terminating initiatives that are no longer desirable for implementation.

Hernando County distributes information about each LMS meeting, which is open to the public, via e-mail lists of interested parties and by official Public Notice in Local New Papers. The LMS Planning Committee has continued to meet, as directed in the by-laws (see Appendix B), to prepare updates to our documents, as well as provide updated information on our priority project list, funding and training opportunities.

Below is a summary of each meeting leading to the 2025 update. For each meeting, stakeholders were invited to participate in the LMS update via e-mail and meeting notices.

Meeting Date	**Meeting Summary**
December 13, 2024	Project Kickoff meeting to discuss Hazard Identification, Outreach Plan, and LMS project list.
January 9, 2025	Hazard descriptions, previous occurrences and extent.
January 17, 2025	Vulnerability Assessment and Mitigation Goals **This meeting was followed by a public workshop to seek input on the hazard identification and risk assessment.**
March 21, 2025	Review of final draft document, transmit to FDEM
April 18, 2025	Review of final document **This meeting was followed by a public workshop to seek input on the final document.**

2.4 Hazard Identification and Risk Estimation

Building upon the 2020 LMS Hazard Identification, an all-hazards approach to identify, classify, and quantify the risk and vulnerability of natural and manmade hazards that threaten all or portions of the community was used for the 2025 HIRA. Depending on the participating jurisdiction, a variety of information resources regarding hazard identification and risk estimation were available. Hazard specific data and maps were used whenever applicable, and GIS-based analysis was conducted of hazard areas and the locations of critical facilities, infrastructure components, and other properties located within the defined hazard areas. The likelihood or probability that a hazard will impact an area, as well as the consequences of that impact to public health and safety, property, the economy, and the environment, were evaluated. This comparison of the consequences of an event with its probability of occurrence is a measure of the risk posed by that hazard to the community. The estimated relative risks of the different hazards it has identified were compared to highlight which hazards should be of greatest concern during the upcoming mitigation planning process.

Valuations and potential losses by hazard for every structure located within the county were determined and incorporated into each hazard. By analyzing valuation and potential losses for the county on a parcel-by-parcel level, the Planning Committee received a more complete picture of potential damage.

Estimating the relative risk of different hazards was followed by the assessment of the vulnerabilities in the likely areas of impact to the types of physical or operational agents potentially resulting from a hazard event.

2.5 Vulnerability Assessment

The method used required a methodical, qualitative examination of the vulnerabilities of all structures within the county to the impacts of future disasters. Hazards were ranked based on a Vulnerability Scorecard which provides a score measured by the Frequency, Probability and the Magnitude of risk for each hazard.

Table 2-2 Vulnerability Scorecard

Frequency	Ranking of how often hazard occurred in the past. 1 - Not Likely: every 50-100 years 2 - Likely: every 5-10 years 3 - Very Likely: annually
Probability	Ranking of the likelihood of the hazard occurring in the future. 1 - Not Likely: every 50-100 years 2 - Likely: every 5-10 years 3 - Very Likely: annually
Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 1. Low: no injuries or deaths recorded 2. Medium: injuries recorded, but no deaths 3. High: deaths recorded Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to the hazard occurrence. 1. Low: little to no impact or damage to infrastructure and economy recorded 2. Medium: minor impact or damage to infrastructure and economy recorded 3. High: significant impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 1. Low: little to no damage to environment recorded 2. Medium: minor damage to environment recorded 3. High: significant damage to environment recorded

Vulnerabilities that can be addressed by targeted mitigation initiatives are proposed and incorporated into this strategy. The LMS Working Group also reviewed past experiences with disasters to see if those events highlighted the need for specific mitigation initiatives based on the type or location of damage they caused. The LMS Planning Committee was then asked to review and comment on the HIRA during the planning process.

2.6 Developing Hazard Mitigation Initiatives

A procedure for characterizing and justifying the mitigation initiative proposed by each participating jurisdiction for incorporation into this plan was established in the development of the initial strategy document. The vulnerability assessment enabled the LMS Planning Committee to highlight the most significant vulnerabilities and to assist in prioritizing subsequent efforts to formulate and characterize specific hazard mitigation initiatives to eliminate or minimize those vulnerabilities.

The STAPLEE method assesses specific project elements and ranks projects based on a point system according to the element which the group considers having the most value. The elements considered in the STAPLEE method include Social, Technical, Administrative, Political, Legal, Economic, and Environmental factors. The group was asked to consider whether this methodology was acceptable for use in Hernando County and then requested to take a formal vote to formally adopt this methodology for the assessment and prioritization of the LMS project list.

2.7 Developing the Local Mitigation Action Plan

Potential mitigation programs and projects were discussed by the group on the basis of the identified community Goals and Objectives and hazard vulnerability. Existing projects were updated by their respective owners and new projects were identified, presented, prioritized on the project list during this process.

2.7.1 Integration with Existing Plans

The regional planning council staff reviewed all of the elements of the 2020 LMS to determine the most current information and identify any new and updated materials to present to the LMS Planning Committee for consideration during the 2025 update process. They collected and analyzed a variety of existing plans, studies, reports, and technical documents. These were reviewed to compare the existing documents available in each jurisdiction and to formulate possible mitigation strategies to overcome any perceived gaps in capabilities. Based on their findings, much of the information used to update the four major steps has either not changed or presented only minor changes.

The documents reviewed are listed below along with discussion of how they were incorporated into various parts of the Hernando County LMS. Each jurisdiction is responsible for reviewing the LMS with their local plans and to provide updated information for use with the LMS re-writes as needed.

- Existing Hernando County Local Mitigation Strategy (2020). This was used as the basis for the updated 2025 LMS. As part of the planning process, the LMS Planning Committee was asked to identify any hazard events that had occurred since the adoption of the previous LMS, and identify any new mitigation measures that should be included in the updated LMS.
- Hernando County Comprehensive Plan (2040 Horizon). The Comprehensive Plan was used to garner the future direction of the County such as land development, proposed infrastructure, future land use, economic development, and conservation. The Comprehensive Plan was used to ensure that the goals and objectives in the LMS were consistent with other goals and objectives in the County.

- Hernando County & Municipal Codes of Ordinances. The ordinances were used to assess the capabilities of the County, and the City of Brooksville. In addition, the codes were used to help determine some potential mitigation measures.
- Comprehensive Emergency Management Plan (CEMP) (2012). The CEMP was used to help identify the pertinent hazards for the LMS risk assessment. In addition, the CEMP was used to assess the County's capabilities and available resources. Annex II of the CEMP on Hazard Mitigation describes how Hernando County and its municipalities work within the community on a normal day-to-day operation and what mitigation activities would be required during and after a disaster. The provisions of the revised LMS should be incorporated into this annex of the CEMP.
- Hernando County Emergency Management Strategic Plan 2017-2020 establishes goals for the Emergency Management Department for a three-year period. Mitigation goals were reviewed for consistency with the EM department goals.
- Statewide Hazard Mitigation Strategy (2023). The Statewide Hazard Mitigation Strategy serves as a model for all Local Mitigation Strategies. The hazard identification was reformatted to align with the hazards identified in the SHMP to facilitate more consistency across the state. Additionally, language relating to climate variability was modeled after the state plan.
- Hernando County Community Wildfire Protection Plan (CWPP) the current CWPP is a stand-alone document produced by the Florida Fire Service in partnership with Hernando County Fire Rescue. The 2025 LMS continues to incorporate the requirements of the CWPP, so that a separate document is no longer needed, and ensure that the CWPP is updated regularly.

2.8 Approval of the Current Edition of the Strategy

At the end of the planning period, the prepared document was released to the community and for action by the elected governing bodies of the jurisdictions and organizations that participated in the planning process. By resolution, the governing body approves, endorses, or acts on its own component of the plan and addresses the implementation of mitigation initiatives its own representatives proposed. Resolutions for adopting the strategy document by each governing body can be found in Appendix C.

2.9 Implementation of Approved Mitigation Initiatives

Once incorporated into the Joint Unified Local Mitigation Strategy, the agency or organization proposing the initiative becomes responsible for its implementation. This includes developing a budget for the effort or making an application to state and federal agencies for financial support for implementation.

3.0 Hazard Identification and Risk Assessment

3.1 Overview

The hazard identification and risk assessment for Hernando County provides the factual basis for developing a mitigation strategy for the Unincorporated Hernando County and the City of Brooksville. This section profiles the natural, human-caused, and technological hazards that could possibly affect the county. Each natural hazard profile includes a discussion of the geographic areas affected, the historical occurrences in the county, an impact analysis, the probability, and the vulnerability and loss estimation by jurisdiction and of critical facilities. Alternatively, the human-caused and technological hazards include similar topics of discussion, but not all aspects are able to be quantified. This is because of the limited data available and the imprecise nature of the human-caused and technological hazards.

Because of the extensive data available to determine vulnerability to natural hazards, the natural hazard profiles contain complete analyses. However, there is less data available to determine vulnerability to human-caused and technological hazards. Because of this, the human-caused and technological hazard profiles differ from the natural hazard profiles and may not contain complete vulnerability analyses.

3.1.2 2025 Update

The 2025 hazard identification was modeled after the risk assessment for the 2023 State of Florida Enhanced Hazard Mitigation Plan (SHMP). Each natural hazard that was identified in the SHMP was considered in the Hernando County risk assessment. The LMS Planning Committee also reviewed the technological and human-caused hazards identified in the SHMP.

In addition to the general body of literature on hazard vulnerability and hazard mitigation, the following reports and data specific to Hernando County:

- Declared Events
- National Climatic Data Center (NCDC)
- Flood Insurance Rate Maps (FIRMs)
- Property appraisal data
- Comprehensive Emergency Management Plan (CEMP)

3.1.3 Identified Hazards

The list below shows the natural hazards that are profiled in this risk assessment.

- Flood
- Tropical Cyclones
- Severe Storms
- Wildfire
- Erosion
- Drought
- Extreme Heat
- Geological
- Winter Storm
- Seismic
- Tsunami

Erosion, seismic events, landslides and tsunamis were determined to be very low risk hazards for Hernando County. As

such, a brief overview of these hazards was included, however, these hazards will be omitted from a full vulnerability assessment. The LMS Planning Committee also reviewed the technological and human-caused hazards identified in the SHMP. Based on the previous LMS update, risk maps included in the SHMP, and previous occurrences throughout the state, the following technological and human-caused hazards will be included in the risk assessment:

- Hazardous Materials Incident
- Biological Incident
- Cyber Incident
- Terrorism

3.1.4 Hazard Profiles

These hazard profiles all follow the same outline, the sections and a short description of the intent of the section is listed in the table below.

Table 3-1 - Hazard Profile Description

Hazard Profile Section	**Description**
Description	This section includes a basic overview of the hazard, such as causes, various types of the hazard, the measurements of the hazard, advisories for the hazard and any other pertinent information. There are also statements about the overall frequency and magnitude determinations that were made regarding the hazard. Each hazard description includes a section titled "Potential Impacts of Climate Variability," where the potential impacts of climate change on that hazard are discussed. If there are no known potential impacts of climate change for a given hazard, there is a statement in place of the discussion.
Location	This section discusses the areas of the county that are likely to be impacted by the hazard. There may also be references to where the hazard has occurred in the past.
Extent	This section includes a description of the strength or magnitude of the hazard.
Previous Occurrences	This section updates the lists of significant occurrences to include data between 2020 and 2025. If there are significant occurrences before 2014, these will also be included. Where the number of hazard events is too numerous, a summary will be provided.
Probability	This section includes a description of the likelihood of the hazard occurring in the future. Where possible, annual probability is also determined by averaging the number of occurrences within a specified timeframe. There is also a statement about the determined overall probability of the hazard.
Summary of Impacts	This section lists impacts that are possible due to the hazard occurring in the state. They are categorized into impacts affecting: Public First Responders Continuity of Operations (including continued delivery of services) Property, Facilities, Infrastructure Environment Economic condition of the jurisdiction; and Public Confidence in the Jurisdictions Governance These categories align with EMAP Standard requirements.
Hazard Priority Index	Based on the findings from the preceding sections each hazard is assigned a priority index score based on the methodology described below.

Vulnerability Analysis	This section includes a discussion of the overall vulnerability and an estimation of losses possible. It also includes the type and number of critical facilities located in risk areas when applicable. The vulnerability analysis includes the population in risk areas were applicable.

3.1.5 Methodology

In order to remain consistent with neighboring jurisdictions and the state, the hazard description, extent, and summary of impacts were modeled after language used in the Statewide Hazard Mitigation Plan. The description of the summary of impacts was made more specific by identifying existing emergency management challenges. The extent for each hazard will include the most severe hazard event recorded in Hernando County.

Previous occurrences were updated using the National Centers for Environmental Information (NCEI) storm event database to include hazard event data from 2014 to 2019. Where there were too many events to list, a summary will be included, and major events will be described in more detail. Probability will be updated to include hazard events that occurred since the last five-year update.

Location of a hazard was determined by risk maps where available, however some hazards were found to affect all portions of the county equally.

Each hazard was assigned a score based on the categories of probability, impact, spatial extent, warning time, and duration. The point criteria are listed below:

Table 3-2 –Vulnerability Scorecard

Frequency	Ranking of how often hazard occurred in the past. 1 - Not Likely: every 50-100 years 2 - Likely: every 5-10 years 3 - Very Likely: annually
Probability	Ranking of the likelihood of the hazard occurring in the future. 1 - Not Likely: every 50-100 years 2 - Likely: every 5-10 years 3 - Very Likely: annually
Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 4. Low: no injuries or deaths recorded 5. Medium: injuries recorded, but no deaths 6. High: deaths recorded Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to the hazard occurrence. 4. Low: little to no impact or damage to infrastructure and economy recorded 5. Medium: minor impact or damage to infrastructure and economy recorded 6. High: significant impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 4. Low: little to no damage to environment recorded 5. Medium: minor damage to environment recorded 6. High: significant damage to environment recorded

Based on this hazard vulnerability scorecard, all of the evaluated hazards were ranked and categorized into high medium and low priority.

Table 3-3 – Hazard Priority Ranking

High Risk	Flood 11 Tropical Cyclone 11 Tornado 11 Wildfire 11
Moderate Risk	Geological 10 Severe Storms 9 Extreme Heat 8 Drought 8 Terrorism 8 Winter Storms 8 Hazardous Materials 7 Cyber Incident 7 Biological Incident 7
Low Risk	Erosion 5 Seismic Events 5 Tsunami 5

Each vulnerability assessment for natural hazards considered hazards to people, buildings and critical facilities. Where a hazard risk map is available the population, number of buildings and critical facilities. Property appraiser data was used to determine the number of buildings, building value (improved value), and land value within each hazard area. Where building characteristics are vulnerable to a certain hazard, property appraiser data will be used to identify vulnerable buildings. Describing vulnerability in terms of dollar losses provides the community and the State with a common framework with which to measure the effects of hazards on assets. However, the estimated dollar losses obtained through this process are extremely rough and should not be used for purposes other than mitigation planning.

To determine the population that is vulnerable to a hazard, the 2017 American Community Survey data was mapped at the Census Block Group level. The census data layer was then overlaid by the corresponding hazard risk map using the union function in ArcGIS map. Next the ratio of the at-risk Block Group acreage to the overall acreage was calculated. This ratio was then multiplied by the total Block Group population to determine the population vulnerable to the subject hazard.

Critical Assets and Facilities were identified and incorporated from the Hernando County and City of Brooksville Vulnerability Assessment funded by the Florida Department of Environmental Protection (FDEP) to meet the requirements of SS 380.93. by the LMS Planning Committee. Critical asset and facility addresses were geocoded. Like the vulnerability analysis for population, vulnerable critical assets and facilities could only be identified for hazards where a widely accepted risk map is available. This will include flood hazards as determined by the FEMA FIRM map, tropical cyclone storm surge hazards as determined by the SLOSH storm surge map, Wildfire Urban Interface (WUI) and the Flood Vulnerability Assessment. Although no widely accepted sinkhole risk map exists, a risk map was developed for the purposes of this vulnerability assessment. The LMS Planning Committee identified the following facility types to be included in the critical facilities vulnerability analysis:

- Fire Stations
- Government Buildings
- Schools/Shelters
- Hospital and Health Care Facilities
- Electric Utilities
- Water/Wastewater
- Airports
- Power Substations
- Power Plants
- Telecommunication

Correctional facilities are included in the category "government buildings", however in cases where either the Hernando County Jail or State Correctional Facility are in a hazard area, this will be identified in the vulnerability analysis narrative for that hazard. Substation locations were identified using the Homeland Infrastructure Foundation Electric Substation data set.[11] Wastewater utility locations were derived from the FDEP Wastewater Facility Regulation (WAFR) data set.[12] For the purposes of the critical facilities analysis active domestic wastewater facilities with a design capacity greater than 0.05 million gallons per day (MGD). were considered. Potable water was derived using the FDEP Public Water Supply data set.[13] For the purpose of the critical facility analysis, potable water supply tanks with community public water supply tanks with a tank capacity of over 250,000. To determine which facilities belonged in each jurisdiction the city boundary layer, maintained by Hernando County Geographic Information Systems (GIS) Division, was used.

Natural Hazard Profiles

3.2 Flood Hazard Profile

Hazard Profile	FLOOD
Description	Flooding generally refers to conditions of partial or complete inundation of normally dry land areas from the overflow of inland or tidal water and of surface water runoff from any source. Flood damage is proportional to the volume and the velocity of the water. High volumes of water can move heavy objects and undermine roads and bridges. Flooding can occur as a result of precipitation upstream without any precipitation occurring near the flooded areas. Flooding can also facilitate other hazards such as health concerns and hazardous material events. Based on frequency, floods are the most destructive category of natural hazards in the United States. The loss of life, property, crops, business facilities, utilities and transportation are major impacts of flooding. Economic losses from impacts to major transportation routes and modes, public health and other environmental hazards are key factors in long-term recovery. While many people underestimate the severity of floods, loss of life and property from flooding are real threats in Florida.

[11] https://hifld-geoplatform.hub.arcgis.com/
[12] https://geodata.dep.state.fl.us/datasets/wastewater-facility-regulation-wafr-wastewater-facilities/explore
[13] https://www.arcgis.com/home/item.html?id=2e1d4985c1fb4ae187b9a4f1518c7379

Location	Fresh water flooding often occurs along the Withlacoochee River, which is part of the county's eastern border, and around the numerous lakes and sinks that dot the county. Hernando County has three very distinct regional flood areas. The far western side of the County, between the Gulf and US 19 is known as Weeki Wachee. Due to the low elevation along the western coast, on the Gulf of Mexico, the area west of US 19 is generally anticipated to flood from high tides, coastal storms (surge) and heavy rains events. This is particularly true along the Weeki Wachee River and along the numerous canals and adjoining low-lying roadways. Occasionally, moderate rain events also cause flooding due to saturation or poor drainage. The far eastern end of the County, commonly known as Ridge Manor and east of Kettering Road, is almost entirely within the 100-year flood zone. Running through this area are the Withlacoochee and Little Withlacoochee Rivers. Numerous lakes and drainage retention areas are also present. Flooding along the Withlacoochee River boundaries is common during the rainy season and once the ground has become saturated and little opportunity for speedy percolation remains. While this area is persistently subjected to flood, property owners have previously communicated that they are unable to afford flood insurance, thus the lower number of "repetitive" flood claims in the region. The remainder of the County, except for the southernmost central area known as Masaryktown, is commonly referred to as Brooksville, although it is not technically part of the incorporated City of Brooksville. The incorporated City has several outlying areas that are low lying and subject to flooding.
Extent	Please note that the 500-year flood elevation was not identified in the detailed studies for Hernando County, Zone X, therefore, indicates an area above the 100- year floodplain. Zone X (shaded) describes areas of less than 1 foot of flooding.
Previous Occurrences	**PINE IS 03/12/2022 Flood Cause Heavy Rain** Road closure of Pine Island Drive connecting Cortez Blvd to Pine Island due to flooding of the road. **HERNANDO BEACH 05/22/2022 Flood Cause Heavy Rain** FDEM relayed report called into Hernando County Sheriff Office by public of 3 to 4 feet of water covering road along Spring Hill Drive between U.S. Hwy 19 and Pinehurst Drive, requiring water rescues from some stalled vehicles. Caller shared video on social media also.
Probability	Specific probability is difficult to determine; however, 100-year and 500-year estimates help provide a baseline understanding. It is likely that Florida will continue to be impacted by flooding due to any number of causes annually. Based on historical occurrences, and because Hernando County, as well as the City of Brooksville, is affected by many weather systems which result in flooding, the annual probability of a flood event is Likely. An analysis of flood reports from 2019 to 2024 in Hernando County, from the NCEI Storm Events Database indicates that the probability of a flood event in any given year is between 10 and 100%.

Climate Change	*Inland and Riverine Flooding:* A warming climate could contribute to an increase of rainfall events leading to more frequent inland flooding. Evaporation increases as the atmosphere warms, which increases humidity, average rainfall, and the frequency of heavy rainstorms in many places—but contributes to drought in others.[14] *Coastal Flooding* A warmer atmosphere may influence three drivers of coastal flooding: rainfall intensity and frequency, storm surge intensity, and sea level rise. Rising sea levels could raise the base for coastal floods and storm surge resulting in greater flood depths within existing flood hazard zones. Landward expansion of coastal and tidal rivers, stream floodplains and storm surge zones in areas with relatively flat topography is probable. Rising sea levels could have a disproportionate effect along the Gulf coast shoreline because of its flat topography, regional land subsidence, extensive shoreline development, and vulnerability to major storms. The boundaries of coastal flood zones will change and be subject to greater uncertainty and risk as a result of inundation.[15] *Sea Level Rise* Hernando County is vulnerable to sea level rise given its extensive shoreline and low elevation. The "relative sea level" that is measured by a tide gauge at a particular location, is a function of both changes in the elevation of the sea's surface due to changes in the volume of water in the ocean (eustatic sea level) and vertical movement of the land upon which the tide gauge sits due to subsidence or tectonic movement of the earth's crust. Eustatic sea level rise experienced at any location results primarily from expansion of sea water volume as heat is transferred from the atmosphere to the oceans, and the melting of glaciers and polar ice sheets. Both drivers are expected to cause an increase in the rate at which sea level is rising.[16] Regional eustatic sea level rise may differ from global average eustatic sea level rise due to distance from melting glaciers, different rates of sea level volume expansion because of the salinity and temperature of regional surface waters, and the effects of wind and currents on heat transfer between the atmosphere and the oceans.[17] Rising sea levels would result in gradual coastal inundation, the most immediate impact of which is increased height of high tides. Similarly, to regular tides, as sea levels rise, king tides will reach further inland and result in more severe damage to coastal communities.[18] In addition, rising sea levels may cause landward expansion of coastal flood zones. Through a combination of direct inundation and erosion, rising sea levels also cause recession of both beaches and coastal wetlands (see Coastal Erosion Profile). The increased weight that results from a greater volume of sea water pushes saltwater into coastal aquifers and can worsen saltwater intrusion caused by excessive ground water withdrawal. Rising sea levels also push saltwater further upstream in tidal rivers and streams, raise coastal ground water tables, and push saltwater further inland in soils at the margins of coastal wetlands causing wetland boundaries to expand where they are unimpeded.

[14] https://nca2023.globalchange.gov/chapter/9
[15] https://nca2014.globalchange.gov/downloads/low/NCA3_Full_Report_25_Coasts_LowRes.pdf
[16] https://statesummaries.ncics.org/chapter/fl/
[17] https://www.ipcc.ch/site/assets/uploads/2018/03/ipcc_far_wg_I_chapter_09.pdf
[18] https://www.epa.gov/cre/climate-change-coastal-communities

Impacts	*Public* Flooding events could impact the public and result in injury or death. Injury or death during a flooding event could be caused by drowning, vehicle accidents, delayed emergency response and extended wait times due to obstructed roadways. Residents of flooded areas could become stranded on rooftops or trapped inside buildings or cars. Additionally, flooding could lead to public health concerns related to exposure to hazardous materials or wastewater. Traffic is likely to be impacted by a flooding event as residents evacuate. Accidents may also occur from driving through flooded waters. Cars can be washed away when drivers attempt to drive through water that is deeper than expected. Damage to property may also affect the public due to mold infestation. Residents in flood-affected areas may have to replace damaged furniture, clothing, and other belongings. *First Responders* First responders could be seriously injured when responding to calls during flooding, especially when traversing flooded roadways. Dangerous rescue missions could include rescues from roofs, unstable buildings, and stranded cars. First responders may also be exposed to hazardous materials and wastewater. They may also encounter dangers during power outages including being electrocuted by live downed wires. Continuity of Operations (including continued delivery of services) Floodwater may damage buildings, electrical systems, and paperwork making continued operations difficult or impossible. Floodwater may hinder access to buildings (roads or sidewalks) preventing employees and the public from entering a building. *Property, Facilities, Infrastructure* Floodwater can cause damage to property or carry heavy debris that could cause damage. If water overwhelms the drainage systems, it can backup and cause damage to drains or even result in wastewater release. *Environment* Wastewater discharge during flooding events may cause environmental impacts. Flooding may cause damage to plant and animal habitats, and inundation of agricultural areas could destroy crops. Event generated debris could impact waterway navigation and submerged wetland habitats. *Economic Condition* Closure or delay of businesses because of flooded roads or water damage can lead to losses in revenue. Additionally, crop damage or loss caused by flood inundation could lead to declines in agricultural revenues. *Public Confidence* If floodwater does not recede quickly, it appears as though the water utilities and government aren't able to manage water properly, which calls into question the capability of the government. If public or government offices must close because of restricted access due to floodwater, people may think the government isn't able to handle emergency events and lose confidence in their capabilities. *Flood Insurance* As part of Hernando County's participation in the NFIP, residents and businesses are eligible to obtain flood insurance policies. Within the County there were 1,010 flood insurance policies in effect as of February 12th, 2025. These policies have a total coverage of $253,778,000 with a total premium of $3,392,479.29 . This represents a decrease in the number of policies since the last LMS update in 2018, which was 3,809. To date, NFIP has paid out $64,367,010.33. At the time of the last LMS update in 2018 the NFIP had paid $40,036,277 to residents and businesses in the county for 1,938 total claims.[19]

[19] https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fnfipservices.floodsmart.gov%2Fsites%2Fdefault%2Ffiles%2Fnfip_policy-information-by-state_20241231.xlsx&wdOrigin=BROWSELINK

Vulnerability	Hernando County is vulnerable to flooding hazards because of the number of residents, buildings, and critical infrastructure located in the Special Flood Hazard Area. The overall vulnerabilities to the Special Flood Hazard Areas of Hernando County are: destruction of coastal and riverine habitats, closing of roadways due to floodwaters, disruption of utilities, and risk to homes in the SFHA. The city of Brooksville is vulnerable for the same reasons, while the limited population and infrastructure in the City of Weeki Wachee makes it less vulnerable. There are numerous homes located in the SFHA with various degrees of risk depending on individual flood zones. Based on the American Community Survey (ACS) data from 2017, there are over 20,000 people living in the 100-year floodplain (zones A, AE, and VE). There are 2,833 residents living in the VE zone which is subject to the 1% annual chance of flood and hazards related to storm waves. According to property appraiser data there are 15,737 buildings located in the 100-year floodplain with a total building value of $2.1 billion.

3.2.1 Types of Flooding

Flash Flood

Flash floods, as the name suggests, occur suddenly after a brief but intense downpour. They move fast and terminate quickly. Although the duration of these events is usually brief, the damages can be quite severe. Flash floods also result as a secondary effect from other types of disasters, including large wildfires and dam breaks. Wildfires remove vegetative cover and alter soil characteristics, increasing the quantity and velocity of stormwater runoff and dam breaks release large quantities of water into receiving drainage ways in a very short timeframe. Table 3-4 lists some of the causes of flash floods and riverine floods.

Table 3-4 - Riverine Floods Versus Flash Floods - Causes

Causes of Flooding	**Causes of Flash Floods**
Low lying, relatively undisturbed topography	Hilly/mountainous areas
High season water tables	High velocity flows
Poor drainage	Short warning times
Excess paved surfaces	Steep slopes
Constrictions – filing	Narrow stream valleys
Obstructions – bridges	Parking lots & other impervious areas
Soil Characteristics	Improper drainage

Natural and Beneficial Functions of Floodplain

Flood plains are areas adjacent to rivers, ponds, lakes, and oceans that are periodically flooded at different points in time. Floodplains are hydrologically important, environmentally sensitive, and ecologically productive areas that perform many natural functions. They contain both cultural and natural resources that are of great value to society. Flooding occurs naturally along every river and coastal area. Flood waters can carry nutrient-rich sediments which contribute to a fertile environment for vegetation. Floodplains are beneficial for wildlife by creating a variety of habitats for fish and other animals. In addition, floodplains are important because of storage and conveyance, protection of water quality, and recharge of groundwater.

Riverine Floodplains

Riverine systems such as the Withlacoochee vary in steepness, width, flow, sediment deposition, and erosion. These riverine floodplains typically flood during the spring but are subject to periodic flooding due to

excessive rainfall. The flooding brings erosion and deposition of soils and can determine considerably the shape of the floodplain, the depth and composition of soils, the type and density of vegetation, the presence and extent of wetlands, richness and diversity of wildlife, and the depth of groundwater. The major flood component of a riverine system is the flood way. Flood ways are defined as the area of the watercourse that is necessary to carry the base flood without increasing the water surface elevation more than one foot. Development is heavily regulated in flood way areas. Riverine systems are important habitats for a variety of fish, reptiles, vegetation, and fur- bearing wildlife. These systems provide feeding and breeding grounds for these species. In Hernando County coastal and inland flooding is the result of persistent summer rainfall, as indicated by the USGS Withlacoochee River Gage 02312000 at Trilby, August 8, 2015, Peak stage 62.32, Flood Stage El 60.44.[20]

Depressional Closed Basins

These areas are also prone to flooding during persistent summer rain events when floodwaters rise due to saturated soil and no outfall to discharge to. This is prevalent in the central area of Hernando County specifically in large sink hole watersheds.[21]

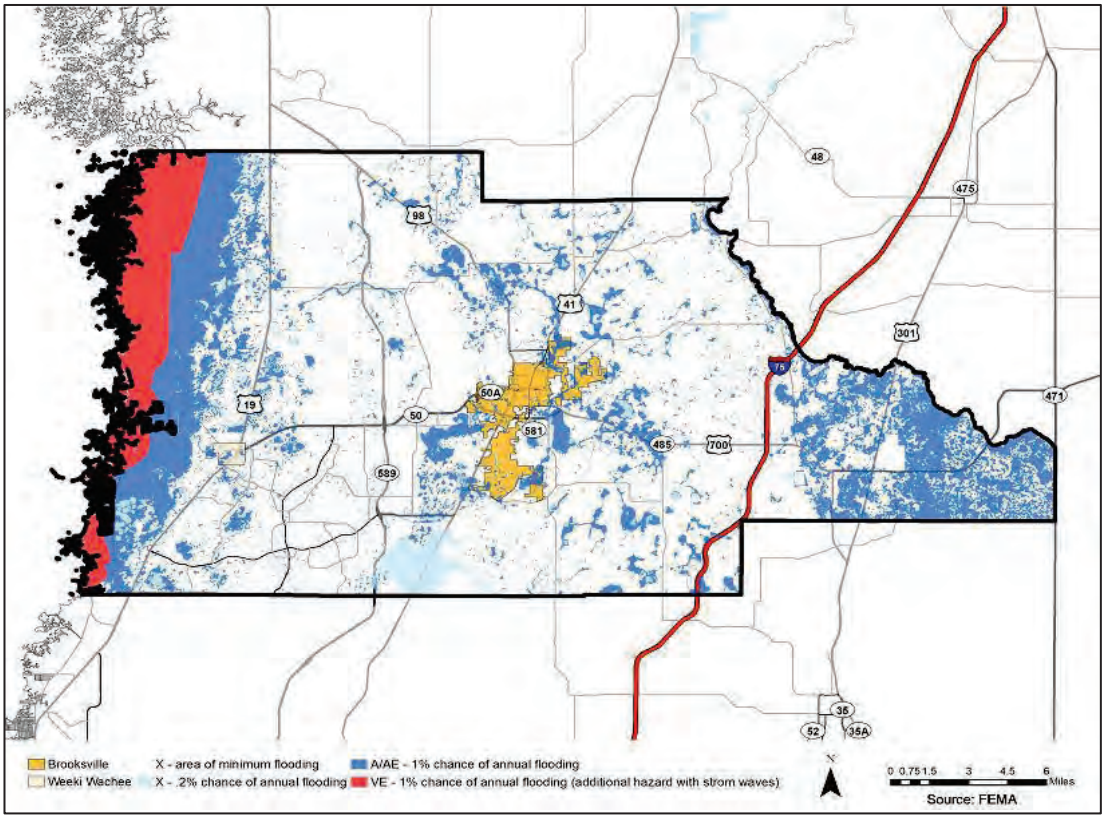
Coastal Floodplains

Marshes, near-shore ocean bottoms, beaches, bays, coastal dune lakes, tidal flats, and estuaries are all components that make up the coastal floodplain. Coastal beaches, dunes, banks, and tidal flats all play roles in protecting the land from destructive coastal storms, such as hurricanes. In coastal systems, aside from major storm events where waves may overrun large areas, inundation follows a largely predictable tidal cycle. Coastal floodplains are recognized for their importance to estuarine and marine fisheries. Estuarine wetlands are important for breeding, nursery, and feeding grounds for marine fisheries and coastal floodplains are important to waterfowl and other wildlife. Shallow coastal areas such as estuaries, tidal flats and rivers, and beaches are significant for shellfish, reptiles, and other finfish. The water quality in these areas is affected by changes in sediments, salinity, nutrients, oxygen, temperature, and the addition of various pollutants. Rivers, creeks, and lakes that have an unimpeded connection to the sea provide breeding and feeding grounds for a variety of coastal marine life. [22]

If the offshore continental shelf is wide and gently sloping, the storm surge will be greater than if the shelf is narrow and steeper. If the land also has a very gentle gradient, then there will be little to stop the storm surge from flooding far inland. This is the case on the Louisiana coast as well as other locations along the Gulf coast.[23]

[20] https://www.tampabay.com/news/publicsafety/withlacoochee-river-flooding-a-nuisance-for-residents-in- southeast-hernando/2243236/
[21] https://pubs.usgs.gov/publication/wri014230
[22] https://www.epa.gov/wetlands/about-coastal-wetlands
[23] https://www.e-education.psu.edu/earth107/node/1515

Figure 3-1- Hernando County Flood Hazard Area [24]



[24] https://www.nhc.noaa.gov/outreach/presentations/2013_07nhcL311_stormSurge.pdf slide 10 & 38 thru 40.

Dams/Levees

US Army Corps of Engineers maintains and updates the National Inventory of Dams, which are considered high potential loss facilities. According to the NID, there are 13 dams within Hernando County (See Figure 3-2.

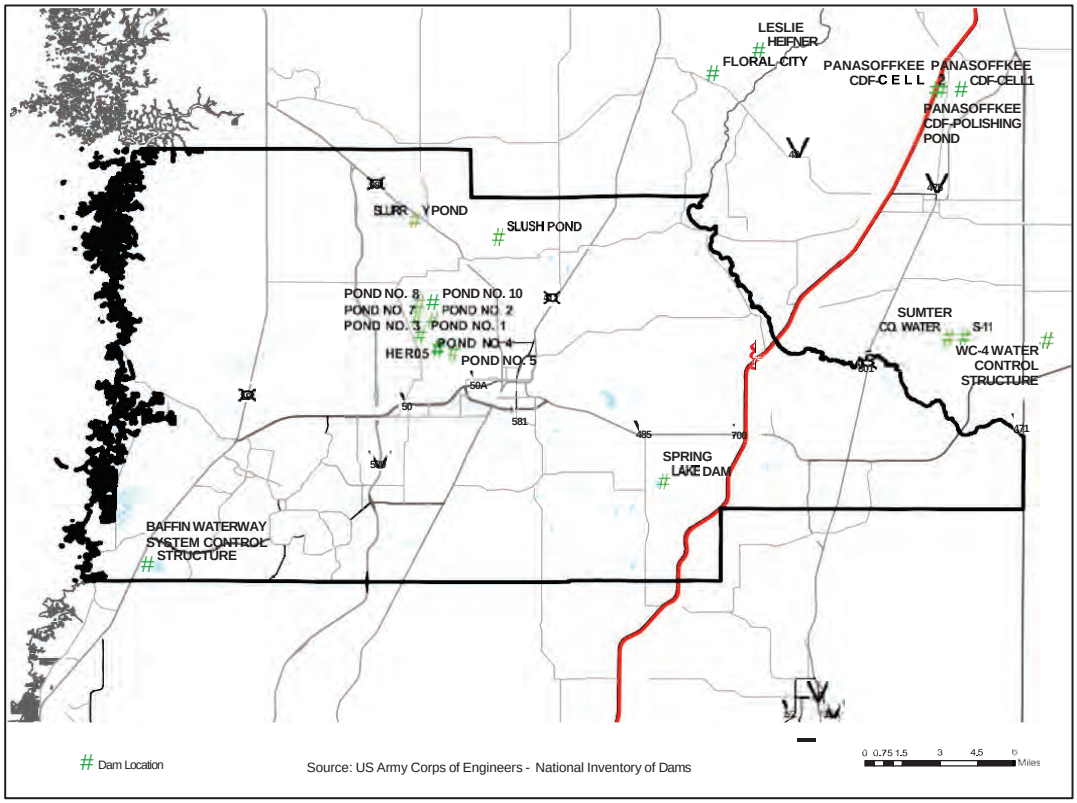
A dam failure could be caused by one or more reasons, such as overtopping by flood events that exceed their capacity, structural material failures, settlement or cracking of both concrete or earthen/embankment dams or a failure to adequately maintain said dam. Sabotage is also a consideration. A failure has the potential to cause damage to infrastructure, private properties and the loss of life.

The extent of a dam failure can be measured in capacity and the amount of time it takes to reach critical flood depth after a failure event. Dam hazard is a term indicating the potential hazard to the downstream area resulting from failure or operational errors of the dam or facilities. The level of risk associated with dams is classified into three categories based on definitions from the US Army Corps of Engineers:

- Low: A dam where failure or operational error results in no probable loss of human life and low economic and/or environmental loss. Losses are principally limited to the owner's property.
- Significant: A dam where failure or operational error results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or affect other concerns. These dams are often located in predominantly rural or agricultural areas but could be located in areas with more dense populations and significant infrastructure.
- High: A dam where failure or operational error will probably cause loss of human life.

The Spring Lake Dam is the only dam in Hernando County with a "High hazard" designation, meaning that a failure would impact people and property downstream.

Figure 3 -2 Hernando County Dam Locations



Other Areas of Flooding

The FEMA Flood Insurance Rate Maps for the County were revised in 2012 to show the data from 17 detailed Watershed Floodplain Justification Studies undertaken in cooperation with SWFWMD. The 2012 maps reflect the findings of the studies performed by FEMA and the Southwest Florida Water Management District. They incorporate information from the study of 20 watersheds.

Three additional Watershed Floodplain Justification Studies have been completed and adopted by Hernando County and SWFWMD for administrative purposes. These studies are for the Peck Sink (13), Squirrel Prairie (20) and the Hernando County portion of the Pithlachascotee River and Bear Creek watersheds (19). The floodplains identified in these studies supersede the floodplains for these watersheds shown in the 2012 FIRM because they are based on improved topographic data and comprehensive Hydrologic and Hydraulic modeling. These studies will be submitted to FEMA for review and revision of the existing FIRM Data.

Figure 3-3 - Hernando County Watersheds

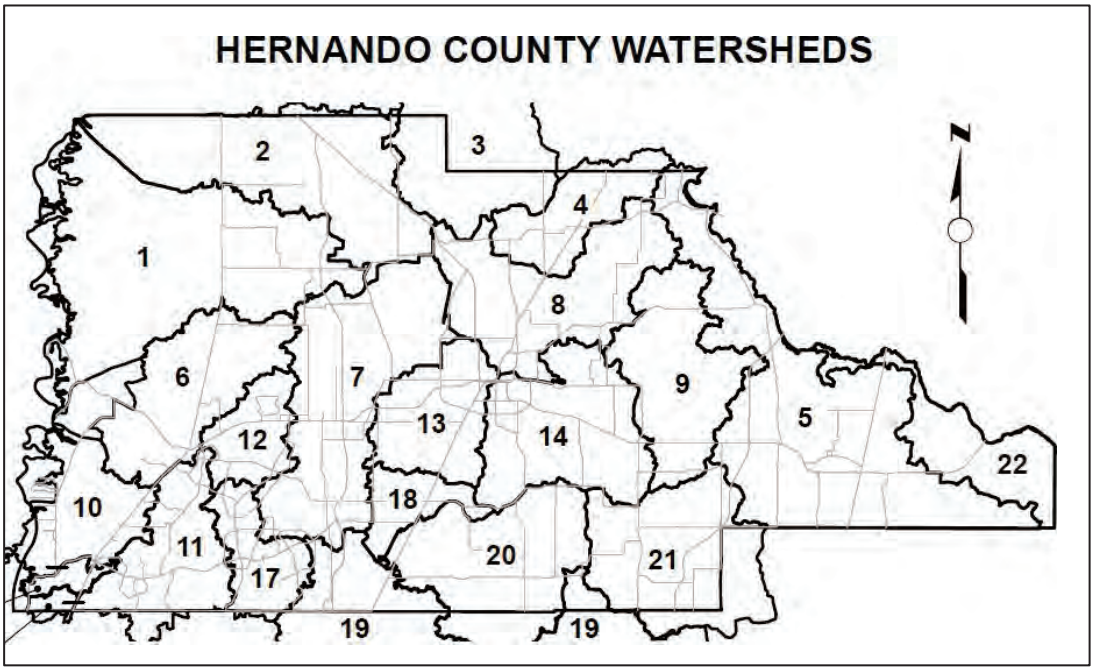


Table 3-5 – FEMA Flood Zone Designations[25]	
Low to Moderate Risk Areas	
C and X (unshaded)	Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level. Zone C may have ponding and local drainage problems that don't warrant a detailed study or designation as a base floodplain. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100-year flood.
B and X (shaded)	Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods. B Zones are also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.
High Risk Areas	
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
A1 – 30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AO	River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
A99	Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.
High Risk Coastal Areas	
V	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. No base flood elevations are shown within these zones.
VE, V1 – 30	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
Undetermined Risk Areas	
D	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.

[25] [27] https://www.fema.gov/flood-zones

3.2.2 Previous Occurrences

In 1998 the Withlacoochee River flooded in January, February and March. In 2003 above normal rainfall caused minor flooding throughout the summer. In September of 2004 heavy rains associated with a busy tropical season brought the Withlacoochee River at Trilby 4.55 feet above flood stage on the 29th and 3.64 feet above flood stage at Croom on the 30th. The Withlacoochee River at Trilby reached 16.55 feet on September 29th and the Withlacoochee River at Croom reached 11.90 feet on October 4th. Both sites fell below flood stage on October 24th.

In 2005, isolated flooding occurred as a result of Hurricane Dennis. The flooding was limited to residential neighborhoods and no disaster declaration occurred, therefore, no loss statistics are available.

The most significant event prior to the 2004 flooding occurred on December 31, 1997. The Withlacoochee River at Croom crested at 10.9 feet, nearly 2 feet above the flood stage of 9 feet. Several homes from Croom south to Ridge Manor were damaged by floodwaters. The most heavily damaged areas were near County Road 575 and U.S. Highway 301. Fifty-four homes were damaged by floodwaters, of which 10 were destroyed and 27 incurred major damage. Damages totaled $1.5 million (Source: National Weather Service website).

The Masaryktown Canal, a Southwest Florida Water Management District-owned flood management system, was constructed in the mid-1960s as part of the U.S. Army Corps of Engineers Four Rivers Basin Program to provide 10-year flood protection for Masaryktown and Squirrel Prairie. It drains areas south and east of Masaryktown into the north end of Crews Lake, which is the headwaters of the Pithlachascotee River. Under normal conditions, sinks in the area of Squirrel Prairie act as surface drains and absorb all runoff from the surrounding watershed. During periods of high ground-water levels, the sinks become flooded, and the canal conveys storm runoff southwest to Crews Lake.

Table 3-6 - Flood Events and Impacts, 2009-2019[26]

Date	Property Damage	Impacts
5/29/2012	$1,000	A narrow heavy rain band from Tropical Storm Beryl flooded parts of County Road 581 between Brooksville to Inverness. Rainfall of three to five inches was measured, with 5.00 inches measured at the COOP station at Brooksville - Chin Hill. Radar rainfall estimates were as high as 8 inches in some parts of the county.
6/24/2012	$940,000	Heavy rainfall of over 8 inches from Tropical Storm Debby fell across the entire county, with the highest storm total of 16.47 inches reported at the CoCoRaHS site near High Point. The storm impacted 1,190 individuals and businesses. At least 83 sink holes opened up as a result of the rain, including one on a runway at the county airport. Storm surge pushed water onto Pine Island, flooding a parking lot and picnic area on the morning of the 25th. Part of the Suncoast Parkway between State Road 50 and US 98 was closed due to flooding from June 24th through July 4th. Some parts of the Parkway were under 5 feet of water.

[26] https://www.ncdc.noaa.gov/stormevents/

6/6/2013	None Recorded	Precipitation from Tropical storm Andrea ranged from around 2.5 inches to around 4.5 inches across the county, with the CoCoRaHS site FL-HN-8 located 3 miles north of Weeki Wachee measuring the highest total of 4.69 inches. Peak storm tide was estimated to be around 4 to 5 feet MLLW on the afternoon of the 6th. Subtracting the predicted astronomical tide, the highest storm surge was estimated to be around 3 to 4 feet MLLW late in the afternoon of the 6th.
9/01/2016	$7.8M	Hermine formed in the Florida Straits south of Key West on August 28th. It remained a very disorganized tropical depression for a few days before the environment around it gradually became more favorable and it became a tropical storm late in the day on the 30th. Hurricane Hermine made landfall just east of St. Marks, Florida around 0130EDT on September 2 as a Category 1 Hurricane with a minimum central pressure of 982 mb, and maximum sustained winds estimated at 70 knots (80 MPH). Heavy rainfall over West-Central and Southwest Florida began on August 31 and continued through September 2, with as much as 20 inches of rain falling in some locations. River flooding from this heavy rain impacted some areas through September 6th. Storm surge generally ranged from 2 to 7 feet above normal high tide, with the highest storm surge value recorded of 7.5 feet at Cedar Key. In Hernando County, storm surge generally ranged from 4 to 6 feet above normal high tide. Damage was estimated at $7,800,000, with 128 properties with minor damage, and 65 with major damage. The storm tide flooded roads and stranded about 975 households in the Hernando Beach community, some of which called 911 to be rescued.
9/11/2017	$5M	Heavy rains from Hurricane Irma caused the Withlacoochee River at Trilby to rise above flood stage on the 11th, with flooding continuing through the rest of the month. The water level crested at 17.67 feet on September 21st, 1.17 feet above the major flooding threshold. This marks the 5th highest river crest on record for the Withlacoochee River at Trilby. Farther upstream on the Withlacoochee River, flooding begin at Croom on the 13th and continued through the rest of the month. The river level crested at 11.27 feet on the 22nd, 0.47 feet above the moderate flood stage. The flood waters entered numerous homes, with Hernando County reporting that 4000 residents were impacted by the flooding. Flood damage to homes was estimated at $5 million.

Table 3-7 – Flood Insurance

	Policies In- force (2/12/2025)	Insurance In- force (2/12/2025)	Total Payments (2/12/2025)
Unincorporated Hernando County	962	$244,712,000	$62,390,787.72
City of Brooksville	48	$9,066,000	$1,976,222.61
Total	1,010	$253,778,000	$64,367,010.33

Hernando County joined the Community Rating System (CRS) in October 1992 and is currently a Class 5 Community.[27] The Class 5 rating allows Hernando County residents in the Special Flood Hazard Areas (SFHA – A and V zones) of the unincorporated areas to receive a 25 percent reduction in their flood insurance premiums. Moving up to a Class 1 rating provides a 45 percent reduction in flood insurance premiums. The City of Brooksville does not participate in the CRS program at this time.

Repetitive Loss and Severe Repetitive Loss

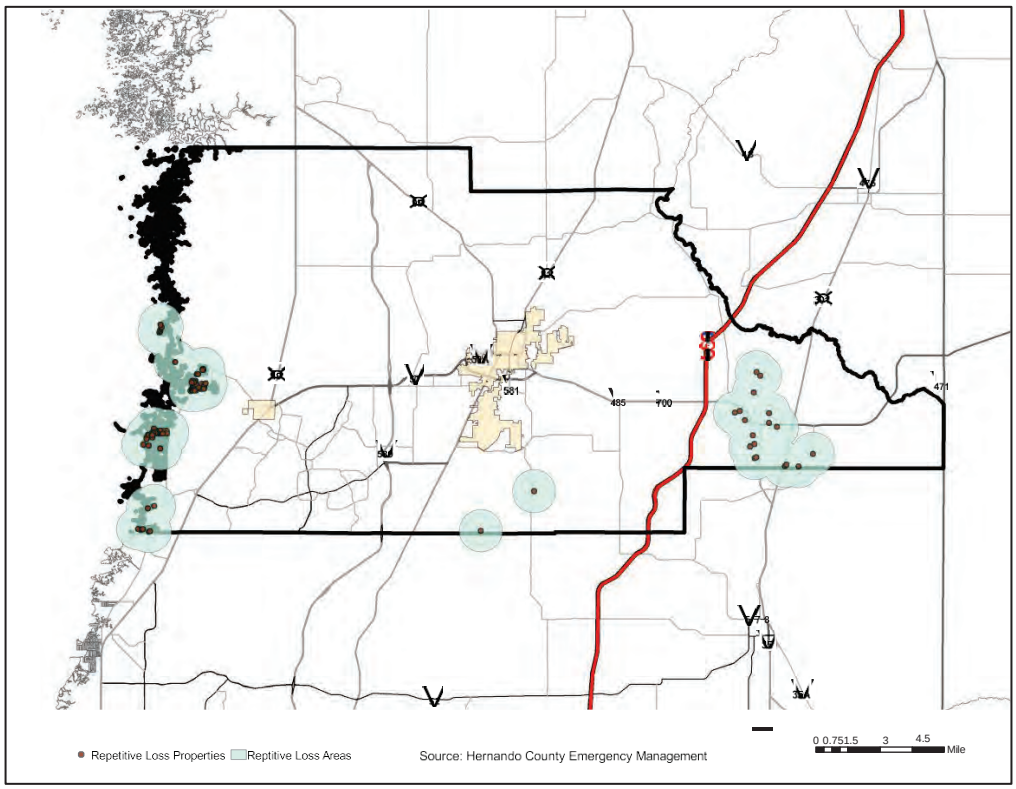
A repetitive loss (RL) property is defined as a facility or structure that has experienced two or more insurance claims of $1,000 or more in any given 10-year period since 1978, under the National Flood Insurance Program. A RL property may or may not be currently insured by the NFIP. As of January 2018, there were 14,887 non-mitigated repetitive loss properties in the State of Florida.[28] A Severe Repetitive Loss (SRL) Property is defined as a property that has had at least four separate flood insurance claims (including building and contents) exceeding $5,000 each, with the total amount of these claims surpassing $20,000.

As of March 26, 2025, there are 370 repetitive loss properties and 84 severe repetitive loss properties in Hernando County, all of which are single-family residential. There are no repetitive loss properties located in the City limits of Brooksville

Review of repetitive loss locations serves as a rough indicator of flood hazard concern areas. Unfortunately, use of these sites in this manner can lead to misdirected mitigation efforts. Repetitive loss properties are identified only if the owner has NFIP coverage. These repetitive loss locations do not reveal those areas where NFIP policyholders do not file claims, do not make the $1,000 threshold, or for those people who do not have flood insurance policies (because of income or lack of knowledge). For this reason, any study analyses will use this tool as a means to supplement flood assessments. Figure 3-2 shows areas identified by Hernando County to be repetitive loss areas.

[27] April 2019 NFIP Flood Insurance Manual. https://www.fema.gov/media-library-data/1555526121163-
[28] Enhanced State Hazard Mitigation Plan, State of Florida, 2018

Figure 3-4 – Repetitive Loss Areas



Hazard Ranking

The LMS Planning Committee determined flooding to be a high priority hazard in Hernando County. As described in the profile above, flooding events within the county are common events. Flooding events may have a high range of impact, accounting for annual damages that exceed $7.8M, as was the case after hurricane Hermine caused storm surge flooding in 2016. Table 3-8 outlines the hazard rankings for each of the hazard priority criteria related to flooding.

Table 3-8 – Vulnerability Scorecard

Frequency	Ranking of how often hazard occurred in the past. 3 - Very Likely: annually
Probability	Ranking of the likelihood of the hazard occurring in the future. 3 - Very Likely: annually
Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 1 - Low: no injuries or deaths recorded Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to hazard occurrence. 2 - Medium: minor impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 2 - Medium: minor damage to environment recorded
Total Points	**11**

Table 3-9 – Flood Zone Population

Flood Zone	Total
A	1,279
AE	18,180
AH	595
AO	9
VE	2,833
Total	22,896

-

Table 3-10 - Distribution of Structures in Flood Hazard Areas

Jurisdiction	Number of Properties within the A, AE, V, and VE flood zones	Number of Buildings	Building Value (Improved Value)	Land Value
Hernando County (Unincorporated)	23,059	15,200	$ 2,067,064,984	$ 2,267,936,199
Brooksville	554	525	$ 97,881,352	$ 62,960,647
Weeki Wachee	12	12	$ 8,147,369	$ 33,543,957
Total	23,625	15,737	$2,173,093,705	$2,364,440,880

Fire Stations 6 and 9 are located in the SFHA along with two recreation centers, three schools and the Hernando County Detention Facility. Table 3-11 summarizes the other critical facilities that are in the flood hazard area.

Table 3-11 - Critical Facilities in Flood Hazard Areas

	Unincorporated Hernando County	City of Brooksville	Total
Airports	0	0	0
Assisted Living Facilities & Nursing Homes	0	0	0
Electrical Substations	2	0	2
Fire Station	2	0	2
Government Building	2	0	2
Health Care Center	0	0	0
Schools & Shelters	3	0	3
Potable Water	0	0	0
Wastewater	4	0	4
Communication Towers	1	0	1

3.3 Tropical Cyclone Hazard Profile

Hazard Profile Section	Tropical Cyclone
Description	Hurricanes and tropical storms, as well as tropical depressions, are all tropical cyclones defined by the National Weather Service's National Hurricane Center (NHC) as warm core, non-frontal, synoptic-scale cyclones. They originate over tropical or subtropical waters with deep, organized convection with a closed surface wind circulation around a well-defined center. Once they have formed, tropical cyclones maintain themselves by extracting heat energy from the ocean at high temperatures, releasing heat at low temperatures of the upper troposphere. Hurricanes and tropical storms bring heavy rainfalls, storm surge, and high winds, all of which can cause significant damage. These storms can last for several days and, therefore, have the potential to cause sustained flooding, high wind, and erosion conditions. Storm surge is the abnormal rise in water level caused by the wind and pressure forces of a hurricane or tropical storm. Storm surge is a major component of nor'easter storms along the East Coast of the U.S. Because winds are moving from a north and/or eastward position, winds move across the ocean toward shore and form large waves. Storm surge produces most of the flood damage and drownings associated with storms that make landfall or that closely approach the coastline. Of the hurricane hazards, storm surge is considered to be the most dangerous as nine out of ten hurricane-related deaths are caused by drowning. Storm surge can be modeled by various techniques; one such technique is the use of the NWS's Sea, Lake and Overland Surges from Hurricanes (SLOSH) model. The model is used to predict storm surge heights based on hurricane category. Surge inundation areas are classified based on the category of hurricane that would cause flooding. Tropical Cyclones can produce very strong and destructive winds that can persist for great distance in area and duration even after landfall. Hurricane force winds are extremely dangerous and can cause severe damage and debris. This debris, including signs, pieces of structures not properly secured, and shallow rooted trees, is often then carried by the high winds and can cause further damage.
Location	The entire County, including the City of Brooksville, would be affected by wind- borne debris during tropical storms and hurricanes. However, the City of Brooksville is not vulnerable to coastal storm surge. A map of the storm surge inundation areas for the county is shown in Figure 3-3. The maps indicate the areas of the County that are subject to flood from storm surge from hurricanes or other severe storm events. It shows the worst-case scenario that would be generated by a storm making landfall in the county. It does not show the surge from any particular track, or from all tracks. It does show the worst possible case for each category of tropical storm or hurricane.

Extent	*Wind* Tropical storms have sustained average winds of 39 to 73 mph. When sustained wind intensifies to greater than 74 mph, the resulting storms are called hurricanes. Hurricanes are divided into five classes according to the Saffir- Simpson hurricane wind scale (See Table 3-12), which uses wind speed as the principal parameter to categorize storm damage potential. Historically, Hernando County and Brooksville have been affected by Tropical Storms. However, despite a very low probability of occurrence, a Category 5 storm could affect the entire County. Hernando County implements the Florida Building Code which recognizes the requirement to design for storm force winds. *Storm Surge* Storm surge heights are dependent upon the configuration of the continental shelf (narrow or wide) and the depth of the ocean bottom (bathymetry). In 2010, the National Hurricane Center separated storm surge from the Saffir-Simpson Hurricane Wind Scale because it did not accurately describe storm surge. For example, a Category 1 hurricane could have devastating storm surge, while a Category 5 hurricane could have minimal storm surge. Along most of the Atlantic coast of Florida, a narrow shelf, or one that drops steeply from the shoreline and subsequently produces deep water near the shoreline, tends to produce a lower surge but higher and more powerful storm waves. The Gulf Coast of Florida has a long, gently sloping shelf and shallow water depths, leading to higher surge but smaller waves. The National Hurricane Center forecasts storm surge using the SLOSH model, which stands for Sea, Lake, and Overland Surges from Hurricanes. The model is accurate to within 20 percent. The inputs include the central pressure of a tropical cyclone, storm size, the forward motion, its track, and maximum sustained winds. Local topography, bay and river orientation, depth of the sea bottom, astronomical tides, as well as other physical features are considered in a predefined grid referred to as a "SLOSH basin." Overlapping basins are defined for the southern and eastern coastlines of the continental U.S. The final output from the SLOSH model run will display the Maximum Envelope of Water, or MEOW, that occurred at each location. To allow for track or forecast uncertainties, usually several model runs with varying input parameters are generated to create a map of MOMs, or Maximum of Maximums. For hurricane evacuation studies, a family of storms with representative tracks for the region with varying intensity, eye diameter, and speed are modeled to produce the worst-case water heights for any tropical cyclone occurrence. The results of these studies are typically generated from several thousand SLOSH runs. [29] *Tornadoes* Tornadoes are a significant threat during tropical cyclones and have been associated with the majority that have affected Florida. Tornadoes tend to develop on the leading northwest edge relative to the forward motion (or on the right-front quadrant) of hurricanes, within thunderstorms and rain bands away from the center. The majority of tornadoes that occur with hurricanes are relatively weak and short-lived. In recent years, much of the wind damage in hurricanes attributed to tornadoes has, in reality been the result of downbursts, which are strong downdrafts causing damaging winds on or near the ground. *Rainfall* Tropical Cyclones can produce widespread and heavy rains, which can result in life-threatening and damaging floods. This flooding is the biggest threat from tropical cyclones for people who live inland. Rainfall can cause flash flooding and flooding on rivers and streams that can persist for several

[29] http://www.nhc.noaa.gov/surge/slosh/php

	days after the storm. Rainfall amounts are related to the speed and size of tropical cyclones, not the intensity. This is because a slower moving and larger tropical cyclone has a longer and larger capacity to produce more rainfall. *Rip Currents* The strong winds associated with tropical cyclones can cause rip currents, which are a significant drowning threat to coastal residents and beach goers. Rip currents are channeled currents of water flowing away from shore and can easily pull strong swimmers into the open water. These rip currents can occur at large distances from the storm.[30] The National Weather Service produces Rip Current Outlooks to alert beach goers to the risk of rip currents at a particular beach. There are three levels of outlooks:[31] • Low Risk: The risk for rip currents is low; however, life-threatening rip currents often occur in the vicinity of jetties, reefs, and piers. • Moderate Risk: Life threatening rip currents are possible in the surf zone. • High Risk: Life threatening rip currents are likely in the surf zone.
Previous Occurrences	**INLAND and COASTAL HERNANDO (ZONE) 11/11/2020** Hurricane Eta formed in the central Caribbean Sea on October 31st. In Hernando County the highest wind reported from Hurricane Eta was a gust of 48 mph at a mesonet site in Weeki Wachee. Rainfall was below 5 inches across the area with the highest total being 3.18 inches at the Brooksville-Tampa Regional Airport. **INLAND HERNANDO (ZONE) 07/06/2021** Hurricane Elsa originated from a tropical depression that formed in the central Atlantic east of the Windward Islands on June 30th. In Hernando County the highest wind reported from Hurricane Elsa was a gust of 46 mph at an ASOS site at Brooksville-Tampa Bay Regional Airport. Rainfall was around 2 to 5 inches across the area. **INLAND and COASTAL HERNANDO (ZONE) 09/28/2022** Hurricane Ian formed in the central Caribbean Sea on September 23 and moved through the western Caribbean Sea, Gulf of Mexico and Western Atlantic making four separate landfalls. In Hernando County, maximum winds were estimated between 50 and 65 mph in gusts. Rainfall ranged from 1 to 3 inches, with a maximum total of 1.57 inches near Brooksville. Offshore winds caused below normal tides of 3 to 4 feet. **COASTAL and INLAND HERNANDO (ZONE) 11/10/2022** Hurricane Nicole initially formed as a subtropical storm in the western Atlantic on November 7 between Bermuda and the Bahamas before becoming fully tropical on November 8. The highest wind reported in Hernando County was a gust to 52 mph at Brooksville-Tampa Bay Regional Airport at 8:16 AM EST on November 10. Rainfall ranged from 2 to 4 inches, with a maximum total of 3.5 inches southeast of Brooksville. **COASTAL and INLAND HERNANDO (ZONE) 08/30/2023** Hurricane Idalia made landfall just to the north of the local area near Keaton Beach, FL in Taylor County in Florida's Big Bend as a category 3 hurricane and brought devastating storm surge and wind impacts all along the west Florida coast. Surface observations indicate peak wind gusts generally between 50 to 60 mph, with a maximum gust of 58 mph at Brooksville-Tampa Bay Regional Airport at 6:03 AM EST on August 30. Rainfall ranged from 1 to 3 inches, with a maximum total of 2.88 inches near Spring Hill. Elevated water levels submerged or partially inundated various roadways and structures along the immediate waterfront. There were 115 structures with major damage, 39 with minor damage, and 1 structure was destroyed.

[30] Enhanced State Hazard Mitigation Plan, State of Florida, 2018
[31] http://www/nws.noaa.gov/os/hurricane/resources/TropicalCyclones11.pdf

	COASTAL and INLAND HERNANDO (ZONE) 08/04/2024 Hurricane Debby made landfall just to the north of the local area as a category 1 hurricane near Steinhatchee, Florida, around 6 AM EST August 5. Debby produced storm surge and wind damage across west central and southwest Florida as it passed by the area to the west approaching landfall. Surface observations indicate peak wind gusts generally between 50 to 60 mph, with a maximum gust of 52 mph at Brooksville-Tampa Bay Regional Airport at 10:00 AM EST on August 5. Rainfall ranged from 5 to 10 inches, with a maximum total of 8.34 inches near Spring Hill. A peak water level of 3.41 feet above MHHW was measured at the mouth of the Chassahowitzka River at 6:30 AM EST on August 5. Peak water levels estimated elsewhere along coastal Hernando County generally ranged from 2 to 4 feet. **COASTAL and INLAND HERNANDO (ZONE) 09/26/2024** Hurricane Helene made landfall just to the north of the local area in the Big Bend region of Florida as a category 4 hurricane and brought devastating impacts along and well east of its path. Significant storm surge flooding affected areas along the immediate coast from the Nature Coast southward into parts of southwest Florida and record high water levels were recorded at numerous tidal gauges along the coast. Helene also caused additional impacts due to high winds. Surface observations indicate peak wind gusts generally between 60 to 70 mph, with a maximum gust of 66 mph at Weeki Wachee at 7:28 PM EST on September 26. Rainfall ranged from 2 to 4 inches, with a maximum total of 3.44 inches near North Brooksville. A peak water level of 8.58 feet above MHHW was measured at the mouth of the Chassahowitzka River at 1:15 AM EST on September 27. Peak water levels estimated elsewhere along coastal Hernando County generally ranged from 5 to 8 feet.
Probability	Since tropical cyclones are random in distribution, it is impossible to forecast whether Hernando County will experience a tropical cyclone. However, because of the high frequency of tropical cyclones that have affected Florida in the past, it is reasonable to assume that Hernando County will experience tropical cyclones again in the future. According to data from the NCDC Storm Event Database, from 2019-2020 Hernando County experienced 10 tropical storms and no hurricanes over a fifteen-year period. The probability of a tropical storm or hurricane affecting Hernando County or the City of Brooksville is Likely, with annual probability between 10 and 100%.
Climate Change	A warmer atmosphere could influence two of the factors that affect the generation and strength of tropical cyclones: (1) increased thermal energy resulting from higher sea surface temperatures (SST), and (2) increased vertical wind shear.[32] These effects are likely to counteract each other to some degree.[33] The exact role of increasing SST remains to be determined: tropical cyclone intensity, as measured by power dissipation indices may increase directly as a function of SST, or intensity may be a function of the difference between SST in the cyclone development region and mean global tropical SST.[34] Vertical wind shear disturbs the structure of a tropical cyclone and, therefore, increased shear can lead to system weakening.[35] Tropical cyclone intensity is one of the principal determinants of storm surge height; thus, the net effects of climate change on tropical cyclone intensity will also affect the magnitude of coastal flooding associated with these storms. Tropical cyclone tracks and consequently, the number of systems that make landfall in Florida, could be influenced by atmospheric steering currents and

[32] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3619316/
[33] https://www.ipcc.ch/pdf/special-reports/srex/SREX_Full_Report.pdf
[34] Ibid.
[35] Grossman and Morgan (2011). Tropical cyclones, climate change, and scientific uncertainty: What do we know, what does it mean, and what should be done? Climatic Change, 547

	climate phenomena such as the El Niño- Southern Oscillation, North Atlantic Oscillation, Atlantic Meridional Mode, and Madden-Julian Oscillation.[36] As stated in the flood hazard profile, higher rainfall intensity is likely as atmospheric moisture increases.[37]
Impacts	Hernando County has a high vulnerability to hurricanes, including a Category 4 or Category 5 event, the impact of which would be catastrophic. The number of people affected by hurricanes and coastal storms is significant, and the economic and response costs could be so high that the local governments could not absorb them to facilitate recovery. *Public* Members of the public could be impacted by car accidents during tropical cyclone events because of flood waters, high winds, panic, traffic jams and power outages. The public may also be impacted by slower emergency response, especially when ambulatory care is needed. Emergency response may be obstructed by blocked roads. Members of the public are at risk of death or injury resulting from drowning in flood waters, being hit or crushed by debris, and/or being stranded on rooftops. Exposure to hazardous materials could also impact the public and is possible during a tropical cyclone event. Illness could also be caused by contaminated water. Pets and other animals are at risk of death or injury because of the impacts mentioned above. Preparedness for a tropical cyclone event may cause stress for members of the public related to safety concerns for family members, fear of property damage, being forced to forfeit a pet, and loss of wages. The public could also be impacted by damage to their property during a tropical cyclone event. Homes may be damaged and connections to power may be interrupted or destroyed. Mold damage caused by rainwater or flooding could need expensive mold remediation action. Additionally, the cost and labor to repair damaged homes and other structures could make homes unhabitable. If a property is uninsured these costs fall on the property owner. Residents who experience property damage during a tropical cyclone event may also have to pay out-of-pocket for hotel rooms or live in a shelter until damage is repaired or their home is replaced. Residents may also find their vehicles are damaged after a tropical cyclone event, including damage caused by storm debris or flood waters. Employees may lose wages due to obstructed roadways, damaged vehicles, or damage to their employer's facilities. Residents who evacuate will incur costs related to travel, hotel fees, loss of wages, and loss of perishable food that was purchased before evacuation. Power outages may affect the public due to the cost of generators and gas to run the generators, and the risk of accidental fire or carbon monoxide poisoning. Power outages also increase safety concerns when traffic lights become inoperable. *First Responders* First responders are at risk of injury or death during and after a tropical cyclone event due to storm debris, unstable transportation infrastructure, unstable structures, and exposure to hazardous materials. First responders may also experience increased levels of stress caused by dangerous rescues, and the inability to assist during the storm event. *Continuity of Operations* Continuity of operations may be affected during a tropical cyclone event because of damage to businesses and structures. Utility failures such as electric or gas may prevent business from opening even if there is no damage. Utility failures may also impede or prevent government offices from continuing daily services. Continuity of Operations may also be impacted by severe damage and interruption to transportation systems and

[36] Kossin et al. (2010). https://doi.org/10.1029/2006GL028836
[37] https://www.epa.gov/sites/default/files/2016-08/documents/climate-change-fl.pdf

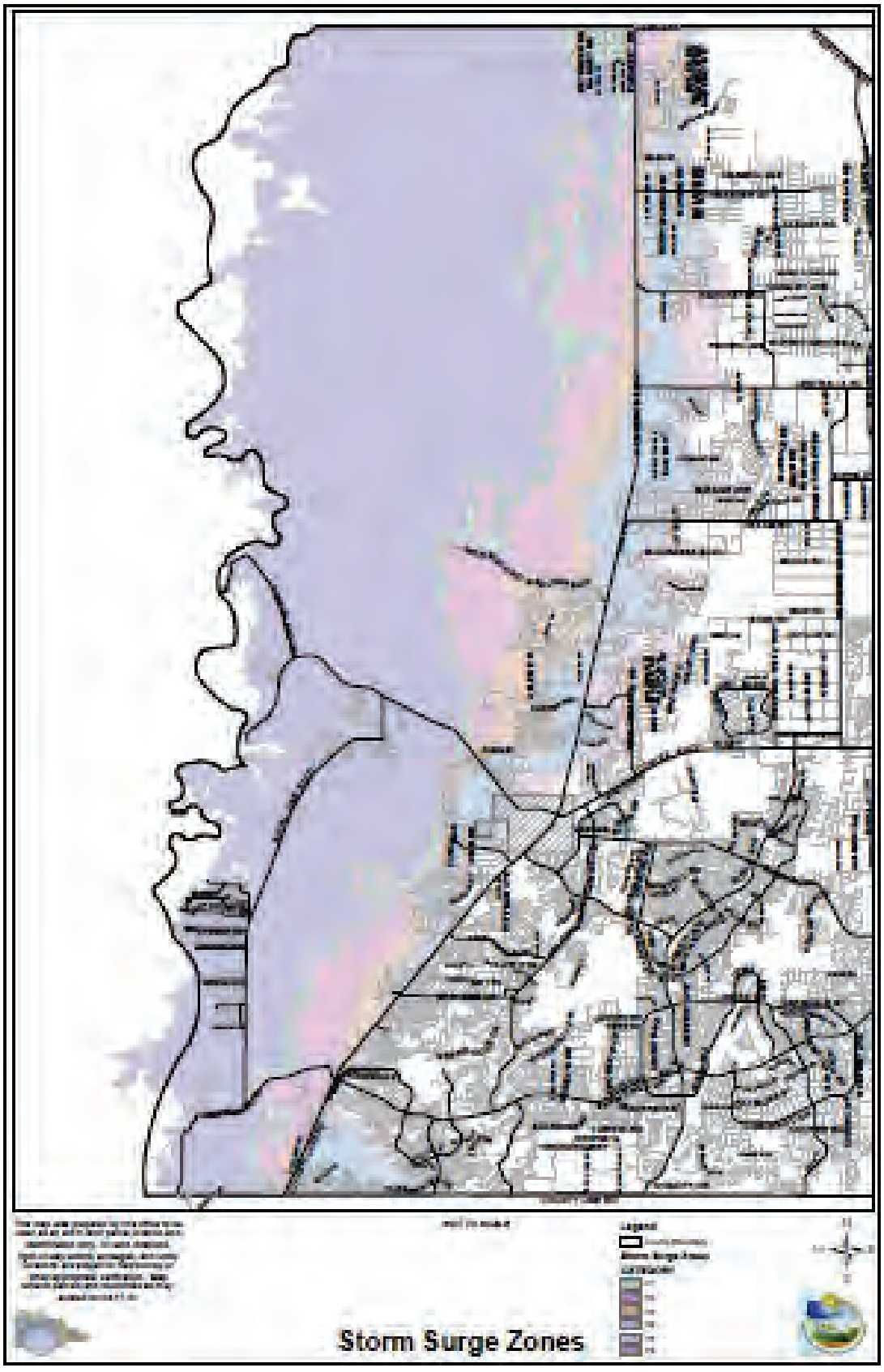
	infrastructure like roads and bridges, communication systems, power, water, and wastewater. *Property, Facilities, Infrastructure* Impacts to property, facilities, and infrastructure may include damaged or destroyed property, such as homes and other buildings. Roofing is particularly susceptible to damage from high winds, while the first floor of many buildings is susceptible to severe damage from flooding. Costs associated with tropical cyclone hazards may include the cost of repairing damage to property such as buildings, the cost of replacing items damaged such as furniture on the first floor of a flooded home, and costs from crop damage or loss. Damage to transportation infrastructure may occur during a tropical cyclone event, like a road being washed out, a bridge collapsing, and/or closure of major transportation networks. If water and/or wastewater infrastructure are impacted, clean water may be inaccessible, and wastewater may be discharged or be difficult to manage. Damage to hazardous waste facilities could result in the release of hazardous materials. *Environment* Environmental impacts caused by tropical cyclone events may include beach and dune erosion, downed trees, and eroded riverbanks. Release of hazardous materials can contaminate or damage the environment. Additional impacts may include loss or damage to habitat for animals because of flooding or high winds, crop damage or loss, event generated marine debris impacting waterway navigation and submerged wetland habitats. *Economic Condition* The economic condition of the jurisdictions may be affected by damaged and destroyed businesses leading to long-term closures and possibly permanent closures. Impacts may also include delayed re-opening of business because of utility issues, and road blockages. Crop damage or loss is another potential economic impact that may result from flooding and high winds. Businesses are likely to struggle due to absenteeism from work. *Public Confidence in the Jurisdiction's Governance* Public confidence in the jurisdiction's governance may be impacted if evacuations are not ordered in time or if shelters are not opened. Public confidence may also suffer if warnings are not communicated effectively or if the jurisdiction is communicating too frequently. Public confidence may also be eroded by over exaggeration of possible storm impacts, especially if the storm doesn't have expected impacts.
Vulnerability	Hernando County is vulnerable to tropical cyclones because of the number of residents, buildings, and critical infrastructure located in the storm surge area. Residents, buildings and critical infrastructure located outside of the storm surge area are vulnerable to flooding from heavy rain and wind damage. The overall vulnerabilities to the coastal areas of Hernando County are destruction of coastal habitats, closing of roadways due to floodwater, disruption of utilities, and risk to homes in the storm surge area. The City of Brooksville is located inland and is not susceptible to storm surge. However, the risk of wind damage during a tropical cyclone incident makes residents, buildings and critical infrastructure vulnerable.

Table 3-12 - Saffir-Simpson Wind Scale and Typical Damages[38]

Category	Sustained Wind Speeds (mph)	Typical Damage
Tropical Depression	<39	Minimal
Tropical Storm	39-73	Minimal
Hurricane 1	74-95	**Very dangerous winds will produce some damage:** Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap, and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
Hurricane 2	96-110	**Extremely dangerous winds will cause extensive damage:** Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
Hurricane 3	111-129	**Devastating damage will occur:** Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
Hurricane 4	130-156	**Catastrophic damage will occur:** Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted, and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Hurricane 5	>156	**Catastrophic damage will occur:** A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

[38] https://www.nhc.noaa.gov/aboutsshws.php

Figure 3-5 – Tropical Cyclone Storm Surge Area



3.3.1 Previous Occurrences

Hernando County has experienced minor to moderate effects from hurricanes, tropical storms and other coastal storms. The coastal communities of Pine Island, Bayport, Weeki Wachee Gardens, Hernando Beach and Aripeka have been impacted by storm surges of 6 – 7 feet. Also, the entire county, including the City of Brooksville, is in the 130 mph basic wind speed zone. See attached maps for storm surges and winds.

According to the NOAA coastal services center web site no hurricanes have made landfall in Hernando County. The last hurricane to make landfall near Hernando was Gladys in 1968, which made landfall near midnight on the 19th of October at Cedar Key in Levy County after grazing the Hernando County coast. Damage in Central Florida was documented at $1.2 million. The population of Hernando County at that time was around 16,000 residents.

Since 1950, 34 hurricanes/tropical storms have passed within 50 miles of Hernando County. Of those 34, only seven have had tracks that crossed over Hernando County and of those seven, two were hurricanes. Those two hurricanes were Hurricane Gladys in 1968 and Hurricane Easy, a Category 3 storm in 1950.

In 2004, three back-to-back hurricanes skirted Hernando County. While each event was classified as a hurricane, Hernando County's impact was limited to tropical storm force winds. Nevertheless, the County's documented approximately $5 million in damage, of which $3.5 million was directly related to debris collection and disposal.

Tropical Storm Debby in June of 2012. Debby lingered for several days over the northeastern Gulf of Mexico and caused high winds and heavy rain before making landfall near Steinhatchee, FL on the 26th. A tropical storm warning was in effect for Levy, Citrus, Hernando, Pasco, Pinellas, Hillsborough, Manatee, and Sarastota counties from 10 AM EDT on June 25th through 8 PM EDT on June 26th. With the outer bands of Tropical Storm Debby, 11 confirmed tornadoes occurred on the 24th. Strong sustained winds prompted the closure of the Sunshine Skyway bridge. Heavy rain across the area caused flooding on several area rivers, the most serious of which was on the Anclote River at Elfers. Additionally, coastal flooding from onshore winds caused 3-5 feet of storm surge between Suwannee River and Bonita Beach, flooding streets and homes and eroding beaches.

In Hernando County, part of the Suncoast Parkway between State Road 50 and US 98 was closed due to flooding from heavy rains. Some parts of the Parkway were under 5 feet of water. Flood waters caused residential flooding and flooded the main major collector road for Spring Hill, limiting access to US 41. The flooding also closed the Hernando County Jail and the State correctional facility on Spring Hill Dr, and limited access to the FDOT maintenance yard.

Table 3-13 - Tropical Cyclone Events and Impacts, 2014-2019[39]

Year	Title	Location	Description	Property Damage
2016	Hurricane Hermine	Coastal and Inland Hernando	Hermine formed in the Florida Straits south of Key West on August 28th. It remained a very disorganized tropical depression for a few days before the environment around it gradually became more favorable and it became a tropical storm late in the day on the 30th. Hurricane Hermine made landfall just east of St. Marks, Florida around 0130EDT on September 2 as a Category 1 Hurricane with a minimum central pressure of 982 mb, and maximum sustained winds estimated at 70 knots (80 MPH). Heavy rainfall over West-Central and Southwest Florida began on August 31 and continued through September 2, with as much as 20 inches of rain falling in some locations. River flooding from this heavy rain impacted some areas through September 6th. Storm surge generally ranged from 2 to 7 feet above normal high tide, with the highest storm surge value recorded of 7.5 feet at Cedar Key. The collective effects of Hurricane Hermine during the period of September 1-6 resulted in just over $219M in property damage, and no fatalities or injuries across West-Central and Southwest Florida. In coastal portions of Hernando County, storm surge generally ranged from 4 to 6 feet above normal high tide. In inland portions of Hernando County, the highest wind gust recorded was 46 knots on the morning of the 2nd at the ASOS at Hernando County Airport. Storm total rainfall ranged from 3 to 6 inches, with the highest value recorded of 5.83 inches at the CoCoRaHS station 2 miles east of Spring Hill. Damage in Hernando County was mostly caused by the storm surge, totaling an estimated $7,800,000, with 128 properties with minor damage, and 65 with major damage. The storm tide flooded roads and stranded about 975 households in the Hernando Beach community, some of which called 911 to be rescued.	$7.8 M
2016	Hurricane Matthew	Coastal Hernando	Matthew developed into a tropical storm on September 28th as it was approaching the Windward Islands. It quickly strengthened into a powerful Category 5 hurricane just two days later while just north of the northern coast of Colombia. Feeling the effects of a trough to the north, Matthew turned north and decimated the nation of Haiti. After Haiti, Matthew headed towards the southeast U.S. coastline and paralleled much of the east coast of Florida and Georgia before ultimately making an official landfall near McClellanville, South Carolina on October 8th as a Category 1 hurricane with 65 knots winds (75 mph) and a central pressure of 967 mb. Matthew's closest approach to Florida kept the center of the eye about 30 miles offshore. Locally impacts were fairly limited as the western portion of the peninsula was on the dry side of the system. Tropical storm force wind gusts were experienced across the area, mainly in gusts, but heavy rainfall and surge were non-existent. Local damage amounts from Matthew were limited to about $50,000. A mesonet station near Weeki Wachee measured a tropical storm force wind gust of 37 knots.	$0

[39] www.ncdc.noaa.gov/stormevents

2017	Hurricane Irma	Coastal and Inland Hernando	In coastal portions of Hernando County, winds from Hurricane Irma were estimated to be around 34 to 50 knots, with the highest wind reported being a gust to 36 knots at the WeatherFlow station XWKI in Weeki Wachee. Rainfall was generally around 5 inches or greater, with the highest rain total being 10.31 inches at a mesonet station near the Withlacoochee River at Trilby. The wind resulted in damage to numerous homes and businesses, as well as knocking over trees and power lines. Hernando County Emergency Management reported that 26 homes or businesses were destroyed by Irma, 45 sustained major damage, 103 had minor damage, and an additional 112 were affected. The total damage from Hernando County was estimated at $6.1 million, including $800,000 in individual assistance claims, and $5.3 million in public assistance claims. Roughly $500,000 of that was estimated to be caused by wind damage in coastal portions of Hernando County. In inland portions of Hernando County, winds from Hurricane Irma were estimated to be around 34 to 50 knots based on surrounding observations. Rainfall was generally around 6 inches or greater. The wind resulted in damage to numerous homes and businesses, as well as knocking over trees and power lines. Hernando County Emergency Management reported that 26 homes or businesses were destroyed by Irma, 45 sustained major damage, 103 had minor damage, and an additional 112 were affected throughout the county. The total property damage in Hernando County was estimated at $6.1 million, including $800,000 in individual assistance claims and $5.3 million in public assistance claims. Roughly $600,000 of that was estimated to be caused by wind damage in inland portions of Hernando County. Additionally, crop damage to citrus plants in Hernando County was roughly estimated at $600,000.	$1.1M
2023	Hurricane Idalia	Coastal	Hurricane Idalia made landfall just to the north of the local area near Keaton Beach, FL in Taylor county in Florida's Big Bend as a category 3 hurricane and brought devastating storm surge and wind impacts all along the west Florida coast, especially in closer vicinity to the landfall area across the Nature Coast. Storm surge flooding reached into homes and businesses as far south as Lee county, and the surge inundation is the highest on record for the Cedar Key area. Hernando County - Surface observations indicate peak wind gusts generally between 50 to 60 mph, with a maximum gust of 58 mph at Brooksville-Tampa Bay Regional Airport at 6:03 AM EST on August 30. Rainfall ranged from 1 to 3 inches, with a maximum total of 2.88 inches near Spring Hill. Elevated water levels submerged or partially inundated various roadways and structures along the immediate waterfront. There were 115 structures with major damage, 39 with minor damage, and 1 structure was destroyed.	
August 2024	Hurricane Debby	Coastal and Inland Hernando	Hurricane Debby made landfall north of the local area along the Big Bend region of Florida near Steinhatchee around 7 AM EST on August 5th as a Category 1 hurricane with maximum sustained winds of 80 mph and a minimum pressure of 979 mb. Despite Debbys track west of the Florida peninsula, impacts overspread the area from coastal locations spreading inland. Storm surge affected the immediate coast from Ft. Myers northward through Cedar Key, where water levels peaked over 4 feet above normally dry ground across the upper Nature Coast and the Cedar Key area. Wind gusts of up to 60 to 70	

			mph affected much of the western Florida coast, with the strongest winds occurring along immediate coastal areas from around Tampa and St. Petersburg northward across Nature Coast locations, producing generally minor damage along with power outages. Torrential rainfall accompanied Debby as the rainbands east of its center moved across the area. Totals as high as 15 to 20 inches were reported, with hardest hit west-central and southwest Florida areas requiring numerous water rescues from flooded vehicles and homes as a result of extensive flash flooding and subsequent river flooding, and at least one official river gauge site established a new record crest. Surface observations indicate peak wind gusts generally between 50 to 60 mph, with a maximum gust of 52 mph at Brooksville-Tampa Bay Regional Airport at 10:00 AM EST on August 5. Rainfall ranged from 5 to 10 inches, with a maximum total of 8.34 inches near Spring Hill. A peak water level of 3.41 feet above MHHW was measured at the mouth of the Chassahowitzka River at 6:30 AM EST on August 5. Peak water levels estimated elsewhere along coastal Hernando County generally ranged from 2 to 4 feet.	
September 2024	Hurricane Helene	Coastal and Inland Hernando	Helene's most pronounced impacts were related to storm surge. Wind gusts of up to 65 to 75 mph affected numerous coastal locations as Helene's center passed offshore to the west, producing some instances of minor to occasional moderate structural and tree damage along with power outages. Rainfall amounts were rather limited due to Helene's forward motion accelerating as it gained latitude while its core passed to the west, and maximum amounts were generally up to around 5 to 6 inches, with highest amounts concentrated across the Nature Coast. Surface observations indicate peak wind gusts generally between 60 to 70 mph, with a maximum gust of 66 mph at Weeki Wachee at 7:28 PM EST on September 26. Rainfall ranged from 2 to 4 inches, with a maximum total of 3.44 inches near North Brooksville. A peak water level of 8.58 feet above MHHW was measured at the mouth of the Chassahowitzka River at 1:15 AM EST on September 27. Peak water levels estimated elsewhere along coastal Hernando County generally ranged from 5 to 8 feet.	$0
October 2024	Hurricane Milton	Coastal and Inland Hernando	Surface observations indicate peak wind gusts generally between 60 to 70 mph, with an isolated maximum gust of 76 mph at Brooksville at 6:32 PM EST on October 9. Rainfall generally ranged from 5 to 10 inches, with an isolated maximum total of 14.15 inches near Trilby. Brooksville-Tampa Bay Regional Airport (KBKV) recorded its second-highest 1-day total rainfall amount of 6.49 inches on October 9, behind the record of 10.24 inches set on June 24, 2012 in association with Tropical Storm Debby. Site records date back to 1998. A peak water level of 0.57 feet above MHHW was measured at the mouth of the Chassahowitzka River at 5:45 AM EST on October 8. Peak water levels estimated elsewhere along coastal Hernando County generally ranged around a foot or less above MHHW, although blowout tide conditions were observed with below normal water levels for a period of time.	$0

Figure 3-6 shows all the tracks of tropical cyclones that affected Hernando County from 1900 to 2016.

Figure 3-6 - Tropical Cyclone Historical Paths[40]

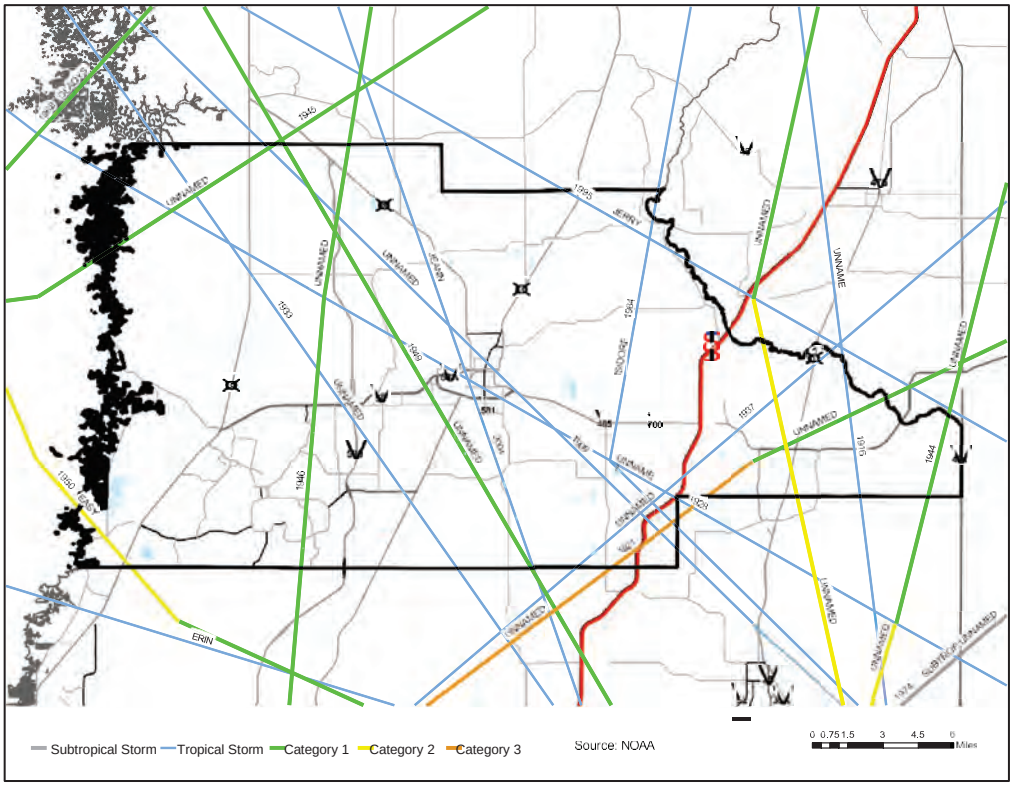


Table 3-14 identifies Hernando County's evacuation clearance times. This information was updated in 2017 as part of the Statewide Regional Evacuation Study conducted by the Regional Planning Councils.

Table 3-14 - Hernando County Evacuation Clearance Times for Base Scenarios

	Evacuation Level A Base Scenario	**Evacuation Level B Base Scenario**	**Evacuation Level C Base Scenario**	**Evacuation Level D Base Scenario**	**Evacuation Level E Base Scenario**
Clearance Time to Shelter	14.5	15	16	19.5	21
In-County Clearance Time	23	27	34	45.5	49.5

[40] https://catalog.data.gov/dataset/tropical-cyclone-storm-segments-within-the-north-atlantic-ocean-and-eastern- pacific-o-1900-2016

Clearance Time to Shelter - The time necessary to safely evacuate vulnerable residents and visitors to a "point of safety" within the county based on a specific hazard, behavioral assumptions and evacuation scenario. Calculated from the point in time when the evacuation order is given to the point in time when the last vehicle reaches a point of safety within the county. Key points to remember for clearance time to shelter include:

- All in-county trips reach their destination within the county outside of an evacuation zone A-E; and,
- This definition does not include any out-of-county trips.

In-County Clearance Time - The time required from the point an evacuation order is given until the last evacuee can either leave the evacuation zone or arrive at safe shelter within the county (which is not in an A-E evacuation zone). This does not include those evacuees leaving the county on their own. Key points to remember for in-county clearance time include:

- All in-county trips reach their destination within the county;
- All out of county trips exit the evacuation zone, but may still be in the county and not left yet; and,
- This definition does not include out-of-county pass-through trips from adjacent counties, unless they evacuate through an evacuation zone.

Hazard Ranking

The LMS Planning Committee determined tropical cyclones to be a high priority hazard in Hernando County. As described in the profile above, the impacts of tropical cyclones within the county are common and the potential for catastrophic damage across a large special extent is possible. Table 3-15 outlines the hazard rankings for each of the hazard priority criteria related to tropical cyclones.

Table 3-15 – Vulnerability Scorecard

Frequency	Ranking of how often hazard occurred in the past. 3 - Very Likely: annually
Probability	Ranking of the likelihood of the hazard occurring in the future. 3 - Very Likely: annually
Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 1 - Low: no injuries or deaths recorded Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to hazard occurrence. 2 - Medium: minor impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 2 - Medium: minor damage to environment recorded
Total Points	**11**

Based on the American Community Survey (ACS) data from 2017, there are over 40,000 people living in the tropical cyclone storm surge area. All of the Weeki Wachee Unincorporated area is located in the storm surge area; however, the City of Brooksville is not susceptible to storm surge. Table 3-16 shows the breakout of population located in the storm surge area by the tropical cyclone storm category. This table reflects vulnerability to surge only, and do not include structures such as mobile homes or population vulnerable to wind outside of the surge zones.

Table 3-16 – Population in Storm Surge Area

Category	Total
Tropical Storm	4,422
1	880
2	990
3	2,770
4	8,276
5	23,278
Total	40,618

Hernando County is vulnerable to damage from hurricanes and tropical storms. Damages from these events combine storm surge, high winds, and inland flooding. Table 3-17 shows the number of properties that are vulnerable to a category 5 storm surge, as well as estimated dollar losses from a surge event.

Table 3-17 - Hernando County Values and Buildings Vulnerable to Storm Surge

Jurisdiction	Number of Properties within Category 5 storm surge area	Number of Buildings	Building Value (Improved Value)	Land Value
Hernando County (Unincorporated)	30,347	22,791	$ 2,798,014,054	$ 1,628,237,969
Weeki Wachee	17	16	$ 9,988,058	$ 34,900,163
Total	30,364	22,807	$2,808,002,112	$1,663,138,132

Fire stations 1, 6 and 12 are located within the storm surge area along with several government buildings, assisted living or nursing care facilities, and the Oak Hill Hospital. Table 3-18 identifies the other categories of critical facilities that are in the storm surge hazard area.

Table 3-18 - Critical facilities in Storm Surge Hazard Areas

	Unincorporated Hernando County	Total
Airports	0	0
Assisted Living Facilities & Nursing Homes	5	5
Electrical Substation	4	4
Fire Station	3	3
Government Building	8	8
Health Care Center	1	1
Schools & Shelters	6	6
Potable Water	0	0
Wastewater	4	4
Communication Tower	2	2

3.4 Severe Storms

Hazard Profile Section	Severe Storms
Description	Thunderstorms are forms of convection produced when warm moist air is overrun by dry cool air. As the warm air rises, thunderhead clouds (cumulonimbus) form and cause strong winds, lightning, thunder, hail, and rain associated with these storms. Instability can be caused by surface heating or upper-tropospheric (50,000 feet) divergence of air (rising air parcels can also result from airflows over mountainous areas). Generally, the former "air mass" thunderstorms form on warm-season afternoons and are not severe. The latter "dynamically driven" thunderstorms generally form in association with a cold front or other regional- scaled atmospheric disturbance. These storms can become severe, thereby producing strong winds, frequent lightning, hail, downbursts, and even tornadoes. Heavy rain from thunderstorms can lead to flash flooding. Strong winds, hail, and tornadoes are also dangers associated with some thunderstorms. Of the estimated 100,000 thunderstorms that occur each year in the U.S., only about 10 percent are classified as severe. The three key elements of a thunderstorm are wind, water, and lightning. The National Weather Service (NWS) considers a thunderstorm severe if it produces hail at least one inch in diameter, winds of 58 mph or stronger, or a tornado.[41] *Lightning* Lightning is defined as a sudden and violent discharge of electricity from within a thunderstorm due to a difference in electrical charges and represents a flow of electrical current from cloud-to-cloud or cloud-to- ground. Nationally, lightning causes extensive damage to buildings and structures, kills or injures people and livestock, starts numerous forest fires and wildfires, and disrupts electromagnetic transmissions. Lightning is extremely dangerous during dry lightning storms because people remain outside due to the lack of precipitation; however, lightning is still present during the storm. To the general public, lightning is often perceived as a minor hazard. However, Lightning-caused damage, injuries, and deaths establish lightning as a significant hazard associated with any thunderstorm in any area of the State. According to the U.S. National Weather Service, the highest death rates in the United States are in Florida. *Hail* Hail is frozen precipitation that can occur during a thunderstorm. Hail forms when raindrops freeze into balls of ice and usually range in size from ¼ inch in diameter to 4 ½ inches in diameter. Damage from hail increases with the size of the hail and can cause damage to vehicles, aircraft, and homes and can be fatal to people and livestock. However, Florida thunderstorms do not often include hail because the hailstones usually melt before they reach the ground because of the generally warm temperatures in the state.[42] *Straight-line winds* Severe Storms often include strong winds that are called “straight-line” winds and are different than the winds in tornadoes. These damaging winds exceed 50-60 mph and can reach up to 100 mph. Damage from these winds is more common than damage from tornadoes in the continental US. Straight line winds form from the outflow of a

[41] Enhanced State Hazard Mitigation Plan, State of Florida, 2018

[42] http://www.nssl.noaa.gov/education/svrwx101/hail/

<table>
<tr><td></td><td>thunderstorm downdraft.[43]</td></tr>
<tr><td>Location</td><td>Severe storm events can occur anywhere within the county. Figure 3-6 below shows the path of thunderstorm winds that impacted Hernando County between 1955 and 2024. As shown, severe storms can impact any portion of the county.
Another component of severe storms is hail. Although hail events are less frequent in Florida than other parts of the country due to the high temperatures, hail events have been recorded in nearly all areas of Hernando County. Figure 3- 7 shows the location of severe hail events between 1955 and 2024.
Like severe storms, tornadoes can also strike anywhere in the County, as well as the City of Brooksville. Tornadoes cannot be predicted and can vary in the path they take depending on weather patterns. More than one tornado can touch down in the County from the same storm system. Figure 3-8 shows the path of tornadoes in Hernando County that occurred between 1950 and 2024.</td></tr>
<tr><td>Extent</td><td>All areas of Hernando County and the City of Brooksville are at risk to all the effects of Severe Thunderstorms.
The National Weather Service (NWS) considers a thunderstorm severe if it produces hail at least one inch in diameter, winds of 58 mph or stronger, or a tornado. According to NCEI storm event data, the highest recorded thunderstorm winds were 70 knots (81 mph). The largest hail recorded in the county was 1.75 inches in diameter. The most severe tornado recorded in Hernando County was an EF1.
While there is no established index for lightning, a lightning strike is considered minimum severity when it has limited impacts on infrastructure (ex. tree limbs) and major severity when it causes extensive damage (ex. Loss of life, fire, structural damage). The potential damage resulting from lightning strikes is primarily loss of life, business interruption, fire and minor structural damage. A false sense of security often leads people to believe that they are safe from a lightning strike because it may not appear to be near their location. However, lightning can strike 10 miles away from a rain column, which puts people that are still in clear weather at risk.
Tornadoes are measured by their intensity or their wind speed, and their area, using the Enhanced Fujita (EF) Scale. The scale ranges from EF 0, with minor damage from winds ranging 65-85 mph, to EF 5 with severe damage from winds in excess of 200 mph.
Measuring hail typically involves determining the diameter of individual hailstones and assessing the overall scale or extent of the storm. This can be done by direct measurement with a ruler or tape measure, or by comparing the hail to objects of known size, like coins or sports balls. The size and scale of hail can also be estimated using radar data and by observing the damage caused by the storm.
<table>
<tr><th>HAIL DIAMETER</th><th>SIZE DESCRIPTION</th></tr>
<tr><td>1/4"</td><td>Pea Size</td></tr>
<tr><td>1/2"</td><td>Mothball Size</td></tr>
<tr><td>3/4"</td><td>Penny Size</td></tr>
<tr><td>7/8"</td><td>Nickel Size</td></tr>
<tr><td>1" (Severe Criteria)</td><td>Quarter Size</td></tr>
<tr><td>1 1/4"</td><td>Half Dollar Size</td></tr>
<tr><td>1 1/2"</td><td>Walnut or Ping Pong Ball Size</td></tr>
<tr><td>1 3/4"</td><td>Golf Ball Size</td></tr>
<tr><td>2"</td><td>Hen Egg Size</td></tr>
<tr><td>2 1/2"</td><td>Tennis Ball Size</td></tr>
</table></td></tr>
</table>

[43] http://www.nssl.noaa.gov/education/svrwx101/wind/

2 3/4"	**Baseball Size**
3"	**Teacup Size**
4"	**Grapefruit Size**
4 1/2"	**Softball Size**

The Beaufort Wind Scale is a numerical scale that describes wind speed and Straight-line winds and its effects on the environment, primarily at sea, but also on land. It ranges from 0 (calm) to 12 (hurricane) and provides descriptive terms for each wind force, helping sailors and those on land visually assess wind conditions.

Land:

Description	Wind Speed	Conditions
Calm	Less than 1 mph Less than 1 km/h	Calm. Smoke rises vertically.
Light Air	1 – 3 mph 1.1 – 5.5 km/h	Smoke drift indicates wind direction. Wind vanes cease moving.
Light Breeze	4 – 7 mph 5.6 – 11 km/h	Wind felt on exposed skin. Leaves rustle and wind vanes begin to move.
Gentle Breeze	8 – 12 mph 12 – 19 km/h	Leaves and small twigs constantly moving. Light flags extended.
Moderate Breeze	13 – 18 mph 20 – 29 km/h	Dust and loose paper raised. Small brances begin to move.
Fresh Breeze	19 – 24 mph 30 – 39 km/h	Branches of moderate size move. Small trees with leaves begin to sway.
Strong Breeze	25 – 31 mph 40 – 50 km/h	Large branches in motion. Whistling heard in overhead wires. Plastic garbage cans tip over. Umbrella usage difficult.
High Wind	32 – 38 mph 51 – 61 mph	Whole trees in motion. Effort needed to walk against the wind.
Gale	39 – 46 mph 62 – 74 km/h	Some twigs broken from trees. Cars veer on the road. Walking is seriously hindered.
Strong Gale	47 – 54 mph 75 – 88 km/h	Some branches break off trees and some small trees blow over. Temporary signs and barricades blow over.
Whole Gale	55 – 63 mph 89 – 102 km/hr	Trees are broken off or uprooted, saplings bent and deformed. Poorly attached asphalt shingles peel off roofs.
Violent Storm	64 – 73 mph 103 – 118 km/hr	Widespread damage to vegetation. Many roofing surfaces are Damages. Damaged asphalt tiles may break completely away.
Hurricane	74 mph + 119 km/h +	Very widespread damage to vegetation. Some windows may break. Severe structural damage. Mobile homes, poorly constructed sheds and barns are damaged. Flying debris possible.

Sea:

Estimating Wind Speed and Sea State with Visual Clues

Beaufort number	Wind Description	Wind Speed	Wave Height	Visual Clues
0	Calm	0 knots	0 feet	Sea is like a mirror. Smoke rises vertically.
1	Light Air	1-3 kts	< 1/2	Ripples with the appearance of scales are formed, but without foam crests. Smoke drifts from funnel.
2	Light breeze	4-6 kts	1/2 ft (max 1)	Small wavelets, still short but more pronounced, crests have glassy appearance and do not break. Wind felt on face. Smoke rises at about 80 degrees.
3	Gentle Breeze	7-10 kts	2 ft (max 3)	Large wavelets, crests begin to break. Foam of glassy appearance. Perhaps scattered white horses (white caps). Wind extends light flag and pennants. Smoke rises at about 70 deg.
4	Moderate Breeze	11-16 kts	3 ft (max 5)	Small waves, becoming longer. Fairly frequent white horses (white caps). Wind raises dust and loose paper on deck. Smoke rises at about 50 deg. No noticeable sound in the rigging. Slack halyards curve and sway. Heavy flag flaps limply.
5	Fresh Breeze	17-21kts	6 ft (max 8)	Moderate waves, taking more pronounced long form. Many white horses (white caps) are formed (chance of some spray). Wind felt strongly on face. Smoke rises at about 30 deg. Slack halyards whip while bending continuously to leeward. Taut halyards maintain slightly bent position. Low whistle in the rigging. Heavy flag doesn't extended but flaps over entire length.
6	Strong Breeze	22-27 kts	9 ft (max 12)	Large waves begin to form. White foam crests are more extensive everywhere (probably some spray). Wind stings face in temperatures below 35 deg F (2C). Slight effort in maintaining balance against wind. Smoke rises at about 15 deg. Both slack and taut halyards whip slightly in bent position. Low moaning, rather than whistle, in the rigging. Heavy flag extends and flaps more vigorous.
7	Near Gale	28-33 kts	13 ft (max 19)	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of wind. Necessary to lean slightly into the wind to maintain balance. Smoke rises at about 5 to 10 deg. Higher pitched moaning and whistling heard from rigging. Halyards still whip slightly. Heavy flag extends fully and flaps only at the end. Oilskins and loose clothing inflate and pull against the body.
8	Gale	34-40 kts	18 ft (max 25)	Moderately high waves of greater length. Edges of crests begin to break into the spindrift. The foam is blown in well-marked streaks along the direction of the wind. Head pushed back by the force of the wind if allowed to relax. Oilskins and loose clothing inflate and pull strongly. Halyards rigidly bent. Loud whistle from rigging. Heavy flag straight out and whipping.
9	Strong Gale	41-47 kts	23 ft (max 32)	High waves. Dense streaks of foam along direction of wind. Crests of waves begin to topple, tumble and roll over. Spray may affect visibility.
10	Storm	48-55 kts	29 ft (max 41)	Very high waves with long overhanging crests. The resulting foam, in great patches is blown in dense streaks along the direction of the wind. On the whole, the sea takes on a whitish appearance. Tumbling of the sea becomes heavy and shock-like. Visibility affected.
11	Violent Storm	56-63 kts	37 ft (max 52)	Exceptionally high waves (small and medium-sized ships might be for time lost to view behind the waves). The sea is completely covered with long white patches of foam lying along the direction of the wind. Everywhere, the edges of the wave crests are blown into froth. Visibility greatly affected.
12	Hurricane	64+ kts	45+ ft	The air is filled with foam and spray. The sea is completely white with driving spray. Visibility is seriously affected.

While there is no established index for lightning, a lightning strike is of minimum severity when it has limited impacts on infrastructure (ex. tree limbs) and major severity when it causes extensive damage (ex. Loss of life, fire, structural damage). The potential damage resulting from lightning strikes are primarily loss of life, business interruption, fire and minor structural damage. A false sense of security often leads people to believe that they are safe from a lightning strike because it may not appear to be near their location. However, lightning can strike 10 miles away from a rain column, which puts people that are still in clear weather at risk.

Previous Occurrences	WEEKI WACHEE 12/24/2020	Thunderstorm	Wind
	NORTH BROOKSVILLE 12/24/2020	Thunderstorm	Wind
	BERKELEY 04/11/2021	Thunderstorm	Wind
	BERKELEY 01/16/2022	Thunderstorm	Wind
	WEEKI WACHEE 03/12/2022	Thunderstorm	Wind
	WEEKI WACHEE 03/12/2022	Thunderstorm	Wind
	BRKSVIL 07/26/2022	Thunderstorm	Wind
	BERKELEY 12/15/2022	Thunderstorm	Wind
	MASARYKTOWN 12/15/2022	Thunderstorm	Wind
	POWELL 12/15/2022	Thunderstorm	Wind
	BRKSVIL 04/27/2023	Thunderstorm	Wind
	BROOKSVILLE 07/24/2024	Thunderstorm	Wind
Probability	Because of the high frequency of thunderstorms recorded in the county in the past, it is reasonable to assume that Hernando County will experience severe storms again in the future. The probability of a severe storm event affecting Hernando County, the City of Brooksville or the City of Weeki Wachee is Highly Likely, with an annual probability of at least 100%.		
Climate Change	Higher temperatures and humidity may increase atmospheric instability associated with the generation of severe thunderstorms and tornadoes. However, vertical wind shear could also decrease, resulting in fewer or weaker severe thunderstorms and tornadoes.[44] [45]However, decreases in vertical wind shear are most likely to occur when convective available potential energy (CAPE) is high in spring and summer months, which could result in more frequent severe storms.[46] Furthermore, days with high CAPE are also likely to occur during times of the year with strong low-level wind shear, increasing the likelihood of the most severe storm events, including tornadoes. [47] There has been an increase in the number of severe storm and tornado reports over the last 50 years. However, it is believed that this increase is attributed to the technological improvements that allow for better identification and reporting of such storms.		

[44] https://www.ipcc.ch/site/assets/uploads/2018/03/SREX-Chap3_FINAL-1.pdf
[45] https://sciencecouncil.noaa.gov/wp-content/uploads/2022/07/SoS_-Fact_Sheet_Tornado-and-Climate_FINAL_March2020_fixed.pdf
[46] https://www.pnas.org/doi/pdf/10.1073/pnas.1307758110
[47] Ibid.

Impacts	Impacts to the public, first responders, continuity of operations, property, facilities, infrastructure, environment, economic condition, and public confidence caused by severe storms are generally the same for unincorporated Hernando County and the City of Brooksville. Impacts to the public during or after a severe storm event may include injury or death due to lightning strikes, dangerous hail, flying debris, or tornadoes. Residents who have inadequate shelter, including those that are in their car at the during a severe storm event are at increased risk of death or injury. Car accidents are also likely during severe storm events. Members of the public may experience survivors' guilt if their house wasn't damaged from a severe storm or tornado while their neighbors suffered property damage, injury, or death. *First Responders* Responding during a severe storm can be very dangerous because of heavy rains, strong winds, hail, lightning, tornadoes. *Continuity of Operations (including continued delivery of services)* Thunderstorms often cause power outages from wind damage to power lines or lightning damage to power stations or other electrical infrastructure. *Property, Facilities, Infrastructure* Factors that contribute to the vulnerability from tornadoes are the abundance of pre-engineered structures (including manufactured housing and metal buildings) and recreational vehicles. Damage to property, including homes and businesses, can occur from strong winds, flooding, or tornadoes. The damage can range from minor roof damage to total structure loss. Damage to critical facilities such as transformer stations could occur due to fallen trees and limbs, causing a power outage. Other utilities, including underground pipelines, may be impacted if not protected from exposure. Communications networks are vulnerable to severe weather conditions if not properly protected from exposure or severe natural forces. Most public safety communications systems within the County are protected from the elements and are secure from interruption during a severe storm. Commercial communications networks are also protected and, unless severely impacted, are expected to remain operational during most severe storms.

Climate Change	Higher temperatures and humidity may increase atmospheric instability associated with the generation of severe thunderstorms and tornadoes. However, vertical wind shear could also decrease, resulting in fewer or weaker severe thunderstorms and tornadoes.49 However, decreases in vertical wind shear are most likely to occur when convective available potential energy (CAPE) is high in spring and summer months, which could result in more frequent severe storms. Furthermore, days with high CAPE are also likely to occur during times of the year with strong low-level wind shear, increasing the likelihood of the most severe storm events, including tornadoes. 50 There has been an increase in the number of severe storm and tornado reports over the last 50 years. However, it is believed that this increase is attributed to the technological improvements that allow for better identification and reporting of such storms.

Impacts	Impacts to the public, first responders, continuity of operations, property, facilities, infrastructure, environment, economic condition, and public confidence caused by severe storms are generally the same for unincorporated Hernando County and the City of Brooksville. Impacts to the public during or after a severe storm event may include injury or death due to lightning strikes, dangerous hail, flying debris, or tornadoes. Residents who have inadequate shelter, including those that are in their car at the during a severe storm event are at increased risk of death or injury. Car accidents are also likely during severe storm events. Members of the public may experience survivors' guilt if their house wasn't damaged from a severe storm or tornado while their neighbors suffered property damage, injury, or death. *First Responders* Responding during a severe storm can be very dangerous because of heavy rains, strong winds, hail, lightning, tornadoes. *Continuity of Operations (including continued delivery of services)* Thunderstorms often cause power outages from wind damage to power lines or lightning damage to power stations or other electrical infrastructure. *Property, Facilities, Infrastructure* Factors that contribute to the vulnerability from tornadoes are the abundance of pre-engineered structures (including manufactured housing and metal buildings) and recreational vehicles. Damage to property, including homes and businesses, can occur from strong winds, flooding, or tornadoes. The damage can range from minor roof damage to total structure loss. Damage to critical facilities such as transformer stations could occur due to fallen trees and limbs, causing a power outage. Other utilities, including underground pipelines, may be impacted if not protected from exposure. Communications networks are vulnerable to severe weather conditions if not properly protected from exposure or severe natural forces. Most public safety communications systems within the County are protected from the elements and are secure from interruption during a severe storm. Commercial communications networks are also protected and, unless severely impacted, are expected to remain operational during most severe storms.

	Environment Impacts on the environment during a severe storm may result from strong winds, flooding, and tornadoes. There may also be severe damage to vegetation in localized areas from a tornado. *Economic Condition* Power outages cause lost revenue and lost wages for businesses and employees. *Public Confidence* Power outages for extended periods may give the appearance that the jurisdictions do not know how to restore power.

Vulnerability	*Population* Occupations that are generally performed outdoors would be the most susceptible to the dangers of lightning include: Landscapers, tree trimmers and mowers, roofers, residential and commercial construction employees, utility workers (cable, telephone, electricity), delivery drivers, lifeguards, farmers, emergency workers (law enforcement and emergency medical services), marine patrol, marine industry workers, painters, sanitation workers, foresters, and road construction crews. Table 3-22 shows the number of workers employed in high-risk occupations *Property* Hailstorms associated with thunderstorms are not limited to any particular area of the county, but may be associated with damage to roofs, skylights, windows, patio furniture and automobiles. If blizzard conditions were to occur, freezing conditions could be debilitating to the elder population living in older housing with no heating. *Critical Facilities* Severe storms can strike anywhere in the county; therefore, all the critical facilities are equally vulnerable and at risk. However, severe storms do not always impact structures. Severe storm impacts on structures, including critical facilities, could include flooding, wind, tornadoes, hail, and lighting. Please refer to the Flood Hazard Profile for the 100- and 500-year floodplain vulnerability and loss estimations. Because of the Florida Building Code, and the speed of most winds during severe storms, most structures do not sustain damage. This is because most buildings are built to withstand hurricane force winds and severe storms often do not have high wind speeds. Tornadoes, however, may cause damage to critical facilities. Hail is unlikely to cause damage to critical facilities. Lightning impacts on structures are minimal.

Figure 3-6: Hernando County Severe Storms Wind Events (1955 – 2024)

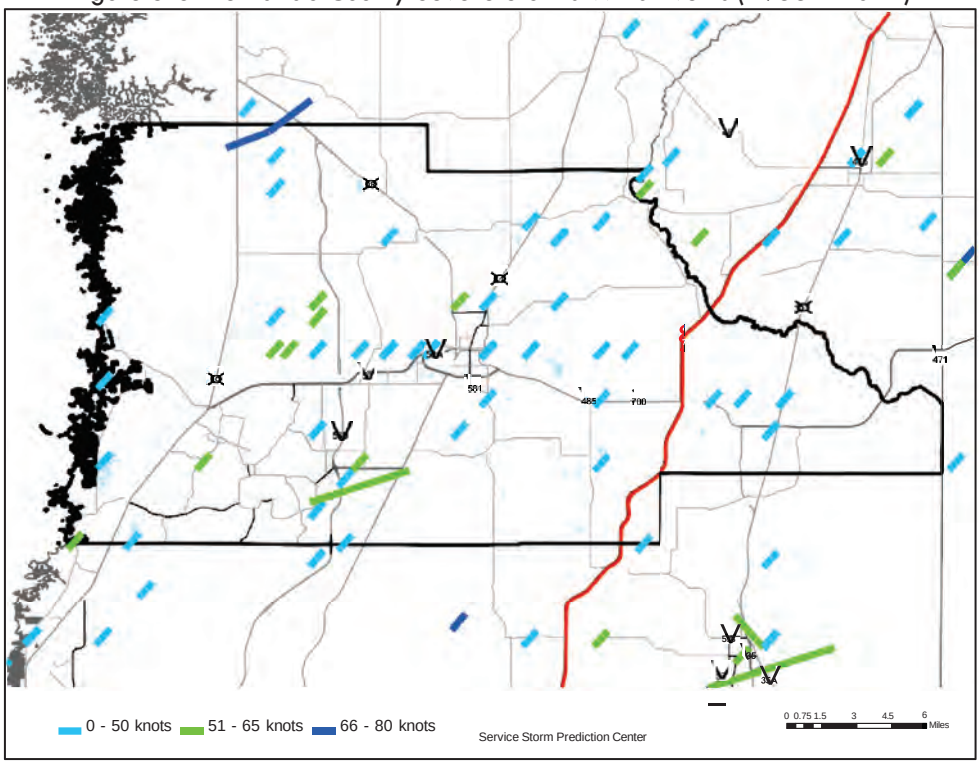
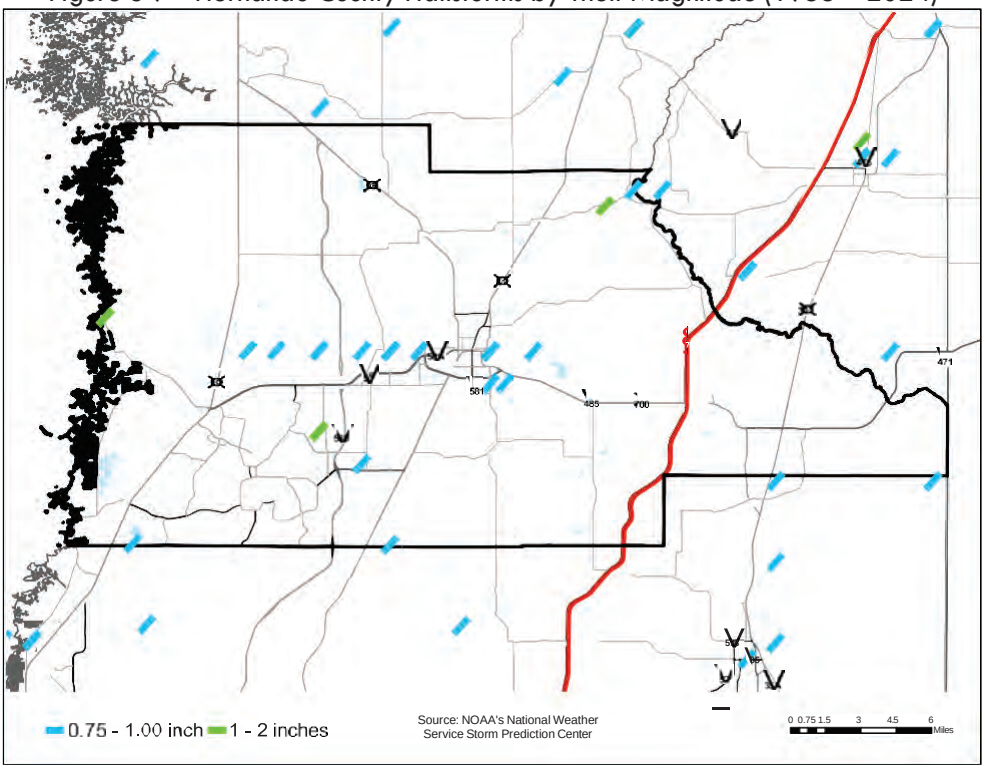


Figure 3-7 - Hernando County Hailstorms by Their Magnitude (1955 – 2024)



3.4.1 Previous Occurrences

Every year damages range from a few hundred to half a million dollars. Because of climatic differences, southern states like Florida experience their most violent tornadoes in winter. Although thunderstorms generally affect a small area when they occur, they are very dangerous because of their ability to generate strong winds, tornadoes, hailstorms, flash flooding and damaging lightning. Table 3-20 lists the lightening related calls reported by Hernando County Fire Rescue between 2014 and 2018.

NOAA Storm Events
Database Event Types:
Lightning

Summary Info:

Number of County/Zone areas affected:	0
Number of Days with Event:	0
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	0
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	0

Table 3-20 – Lightening Related Fire Rescue Calls 2014-2018

Call Type	2014	2015	2016	2017	2018
Lighting Brush	3	17	13	2	0
Lighting Structure	11	5	2	4	3
Storm Damage	3	0	2	6	3

There have been 5 federal disaster declarations related to severe storms and 1 federal disaster declaration for a tornado in Hernando County. [53] There have been 167 reports of thunderstorms (hail, lightning, thunderstorm wind, tornado) since 1950, when the National Weather Service began keeping track of these occurrences. Damages recorded for these events caused $4.33 million dollars of property damages and $45 thousand dollars of crop damage. Not all damages or events are captured in the National Weather Service data so this is likely a more conservative dollar figure than actual damages. The three most costly events were in 1993, 1997 and 2018. In 1993 Thunderstorm wind caused $500,000 worth of property damage. In 1997 A tornado in Brooksville caused $500,000 in property damage, and in 2018 a tornado in Spring Hill caused $500,000 of property damage.

Table 3-21 – Severe Storms 2014 - 2024[48]

Date	Location	Type	Property Damage
02/12/2014	Garden Grove	Thunderstorm Wind	$0
03/29/2014	Bayport & Conrock	Thunderstorm Wind	$4K
4/18/2014	Conrock	Thunderstorm Wind	$0
4/30/2014	Brksvil Hernndo Co F	Thunderstorm Wind	$0
5/25/2014	Masarkytown & Weeki Wachee	Hail	$2K
6/16/2014	Lake Lindsey	Thunderstorm Wind & Hail	$10K
6/27/2014	Ringgold	Hail	$0
5/04/2016	Brooksville & Ringgold	Thunderstorm Wind & Heavy Rain	$10K
01/22/2017	Brksvil Hernndo Co F	Thunderstorm Wind	$0
06/22/2017	Weeki Wachee Acres	Thunderstorm Wind	$6K
07/30/2018	Richloam	Thunderstorm Wind	$1K
11/02/2018	Weeki Wachee Acres (Spring Hill)	Tornado	$500K
4/19/2019	Weeki Wachee & Brksvil Hernndo Co F	Thunderstorm Wind	$20K
05/05/2019	Masarkytown	Thunderstorm Wind	$15K
06/19/2019	Spring Hill	Thunderstorm Wind	$1K
12/24/2020	Weeki Wachee and North Brooksvillle	Thunderstorm Wind	$10K
04/44/2021	Berkely	Thunderstorm Wind	$13K
01/16/2022	Berkely	Thunderstorm Wind	$1K
3/12/2022	Hernando Beach and Weeki Wachee	Tornado, Thunderstorm Wind	$50K
7/26/2022	Brooksville, Hernndo Co F	Thunderstorm Wind	$0K
12/15/2022	Berkely, Masaryktown, Powell	Tornado, Thunderstorm Wind	$50K
4/27/2023	Brooksville, Hernndo Co F	Thunderstorm Wind	$0K
7/24/2024	Brooksville	Thunderstorm Wind	$1K

[48] https://www.ncdc.noaa.gov/stormevents/

There have been 137 thunderstorm wind events, 17 lighting events, 34 tornados, and 28 hail events recorded in Hernando County according to the NCEI Storm Events Database. The likelihood and potential severity of thunderstorm/lightning/hail events can be assessed by reviewing the number and severity of thunderstorm events that have occurred in Hernando County's history. Of the 137 thunderstorm wind events, 72 did not have a recorded magnitude within the NCEI database. Of the remaining 65 recorded events, the recorded wind speeds varied from 39 to 70 knots. Table 3-20 shows the distribution of events by recorded wind speed.

Table 3-22 – Frequency of Thunderstorm Wind Events

Wind Speed (knots)	Number of Events
Not Recorded	72
30-39	1
40-49	8
50-59	50
60-69	5
70-79	1
Total	137

Hazard Ranking

The LMS Planning Committee determined severe storms to be a moderate priority hazard in Hernando County. As described in the profile above, the impacts of severe storms within the county are common with an annual probability of approximately 2 storm events per year. Severe storm events may have a wide range of impacts, accounting for damages that exceed $500,000 as was the case in 2018 when an F1 tornado struck Spring Hill. Table 3-21 outlines the hazard rankings for each of the hazard priority criteria related to severe storms.

Table 3-23 – Priority Risk Index

Frequency	Ranking of how often hazard occurred in the past. 3 - Very Likely: annually
Probability	Ranking of the likelihood of the hazard occurring in the future. 3 - Very Likely: annually
Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 1 - Low: no injuries or deaths recorded Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to the hazard occurrence. 1 - Low: little to no impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 1 - Low: little to no damage to environment recorded
Total Points	**9**

Table 3-24 - Severe Storms Vulnerable Workers[49]

	Number of Workers	Percent of employed population
Civilian employed population 16 years and over	63,962	100%
Fire Fighting and prevention and other protective service workers	1,032	1.6
Law enforcement workers including supervisors	929	1.4%
Building grounds cleaning and maintenance	2,770	4.3%
Farming, fishing and forestry	331	0.5%
Construction	3,396	5.3%

Table 3-25 Severe Storms – Vulnerable Structures

Jurisdiction	Vulnerable Structures (pre-2002 construction)	Number of Mobile Homes	Total Building Value (Mobile homes and pre-2002 construction)
Hernando County (Unincorporated)	63,708	13,325	$ 6,256,524,751
Brooksville	2,778	112	$ 288,734,106
Weeki Wachee	37	0	$ 9,914,858
Total	66,523	13,437	$6,555,173,442

[49] U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates

3.5 Tornado

Hazard Profile Section	Tornado
Description	A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud. Tornado wind speed normally ranges from 65 mph to over 200 mph. The maximum winds in tornadoes are often confined to extremely small areas and vary tremendously over very short distances, even within the funnel itself. Additionally, these storms typically travel around 10 to 20 mph but can move at more than 60 mph. Tornadoes can occur at any time of the year and at any time of day. Tornadoes develop under three scenarios: (1) along or ahead of a squall line ahead of an advancing cold front moving from the north; (2) in connection with thunderstorm squall lines during hot, humid weather; and (3) within a tropical cyclone. The most common, and often the most dangerous, tornadoes come from a supercell thunderstorm. Non- supercell tornadoes form because of spinning air already near the ground, caused by wind shear. These include a gustnado, a whirl of debris with no condensation funnel; a landspout, a narrow condensation funnel that develops while the thunderstorm is still growing; and a waterspout, a landspout that occurs over water.
Location	Like severe storms, tornadoes can also strike anywhere in the County, as well as the City of Brooksville and the City of Weeki Wachee. Tornadoes cannot be predicted and can vary in the path they take depending on weather patterns. More than one tornado can touch down in the County from the same storm system. Figure 3-8 shows the path of tornadoes in Hernando County that occurred between 1950 and 2024.
Extent	Tornadoes are measured by their intensity or their wind speed, and their area, using the Enhanced Fujita (EF) Scale. The scale ranges from EF 0, with minor damage from winds ranging 65-85 mph, to EF 5 with severe damages from winds in excess of 200 mph.
Previous Occurrences	**HERNANDO BEACH 03/12/2022 Tornado EF1** Length 5.8 Miles Width 100 Yards A line of strong to severe thunderstorms produced a tornado as the line moved onshore near Weeki Wachee. Observers reported a waterspout moving onshore shortly after 8AM, with some minor damage observed and reported in the vicinity. The tornado then trekked inland through a protected forest, knocking down trees along a river. Eventually, the tornado emerged in a neighborhood and continued to knock down trees before dissipating just before US19 and SR50. **MASARYKTOWN 12/15/2022 Tornado EF0** Length 9.61 Miles Width 100 Yards NWS survey determined that an EF-1 tornado touched down in extreme northern Pasco County south of Masaryktown then moved into Hernando County before dissipating a few miles west of Interstate 75. Primary damage was near the beginning of track where a home suffered roof damage. Elsewhere, the most damage consisted of snapped or uprooted trees as the tornado tracked mostly over forested area. **WEEKI WACHEE ACRES 07/20/2024** 15:00 **Funnel Cloud**

Probability	Because of the high frequency of thunderstorms recorded in the county in the past, it is reasonable to assume that Hernando County will experience severe storms again in the future. The probability of a severe storm event affecting Hernando County or the City of Brooksville is Highly Likely, with an annual probability of at least 100%.
Climate Change	Higher temperatures and humidity may increase atmospheric instability associated with the generation of severe thunderstorms and tornadoes. However, vertical wind shear could also decrease, resulting in fewer or weaker severe thunderstorms and tornadoes.49 However, decreases in vertical wind shear are most likely to occur when convective available potential energy (CAPE) is high in spring and summer months, which could result in more frequent severe storms. Furthermore, days with high CAPE are also likely to occur during times of the year with strong low-level wind shear, increasing the likelihood of the most severe storm events, including tornadoes. 50
Impacts	Impacts to the public, first responders, continuity of operations, property, facilities, infrastructure, environment, economic condition, and public confidence caused by severe storms are generally the same for unincorporated Hernando County and the City of Brooksville. *Public* Impacts to the public during or after a severe storm event may include injury or death due to lightning strikes, dangerous hail, flying debris, or tornadoes. Residents who have inadequate shelter, including those that are in their car at the during a severe storm event are at increased risk of death or injury. Car accidents are also likely during severe storm events. Members of the public may experience survivors' guilt if their house wasn't damaged from a severe storm or tornado while their neighbors suffered property damage, injury, or death. *First Responders* Responding during a severe storm can be very dangerous because of heavy rains, strong winds, hail, lightning, tornadoes. *Continuity of Operations* (including continued delivery of services) Thunderstorms often cause power outages from wind damage to power lines or lightning damage to power stations or other electrical infrastructure. *Property, Facilities, Infrastructure* Factors that contribute to the vulnerability from tornadoes are the abundance of pre-engineered structures (including manufactured housing and metal buildings) and recreational vehicles. Damage to property, including homes and businesses, can occur from strong winds, flooding, or tornadoes. The damage can range from minor roof damage to total structure loss. Damage to critical facilities such as transformer stations could occur due to fallen trees and limbs, causing a power outage. Other utilities, including underground pipelines, may be impacted if not protected from exposure. Communications networks are vulnerable to severe weather conditions if not properly protected from exposure or severe natural forces. Most public safety communications systems within the County are protected from the elements and are secure from interruption during a severe storm. Commercial communications networks are also protected and, unless severely impacted, are expected to remain operational during most severe storms.

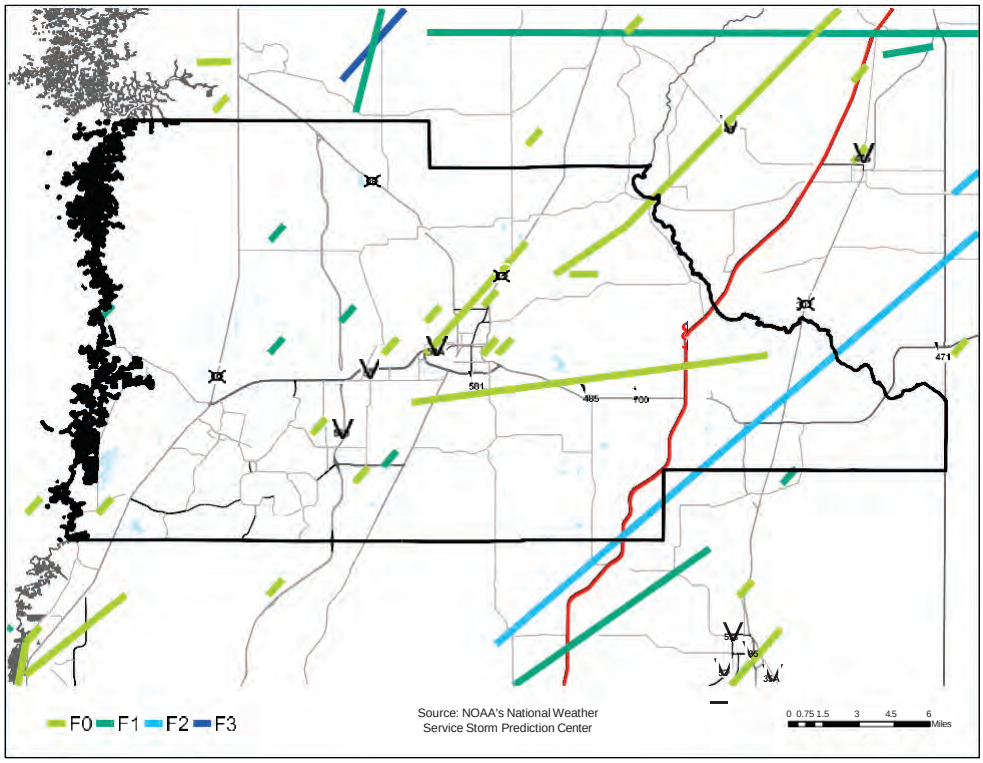
	Environment Impacts on the environment during a severe storm may result from strong winds, flooding, and tornadoes. There may also be severe damage to vegetation in localized areas from a tornado. *Economic Condition* Power outages cause lost revenue and lost wages for businesses and employees. *Public Confidence* Power outages for extended periods may give the appearance that the jurisdictions do not know how to restore power.
Vulnerability	Severe storms can occur anywhere in the County and depending on factors such as wind and weather patterns, all the assets in the county or City of Brooksville may be vulnerable. Tornadoes will not result in 100 percent countywide damages, but rather a path of damages that will vary based on the location of the structure in relation to the path of the tornado and based on the type, size, and construction of the structure. Lightning strikes may be more problematic for older electrical systems. As such, all assets within the county that include mobile homes and pre-2002 construction may be slightly more vulnerable to severe storm events. In 2002 the Florida Building Code superseded all local building codes, making construction requirements across the state more uniform. Table 3-23 shows the estimated dollar losses from a severe storm event. Changes in development: Hernando County and the City of Brooksville will continue to grow. The increase in the development of homes and businesses increases the risk of residents and businesses that may experiencing damage from a tornado. As there is no way to predict a path for future potential tornados it is not possible to guide development to or away from any given area that would decrease the risk. Changes in building materials used for development and encouraging the use of safety shelters built to withstand tornados are a couple ways to manage the increase of risk due to changes in development.

Table 3-19 - Enhanced Fujita Tornado Damage Scale[50]

EF Number	Estimated 3-second gust (mph)	Typical Damage
0 (Gale)	65 to 85 mph	Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; damaged sign boards.
1 (Weak)	86 to 110 mph	Surfaces peeled off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off roads.
2 (Strong)	111 to 200 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
3 (Severe)	136 to 165 mph	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forests uprooted Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
4 (Devastating)	166 to 200 mph	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.

[50] [51] http://climatecenter.fsu.edu/topics/tornadoes

Figure 3-8 - Hernando County Tornados and Their Magnitude (1950 – 2017)



3.5.1 Previous Occurrences

There have been 33 tornadoes (F0/F1), 111 severe storms, and 28 hailstorm events documented in Hernando County by the National Weather Service (website) between 1952 and 2014. The combined total for damages approached $3.7 million.

In 1993, an unanticipated sub-tropical storm ("No-Name" Storm) with winds under 60 mph produced a12-foot storm surge on Pine Island, causing damage, stranding residents, and requiring an evacuation.

On April 23, 1997, a tornado sporadically touched down along a 16-mile path and damaged up to 50 homes from near U.S. Highway 41, four miles southwest of Brooksville, east to the Ridge Manor area. Several trees and power lines were also downed from the tornado before it lifted and dissipated. Most damage to homes in the path of the tornado consisted of minor to moderate roof damage, destroyed porch and pool enclosures and downed trees.

There was a severe outbreak of tornadoes in the region during the late evening of February 22 and early morning of February 23, 1998, across central Florida. One of which was estimated to have reached F4 intensity. Forty-two people lost their lives and over eight hundred residences were destroyed. At the peak of the storms thousands of utility customers lost power. Damages were approximated at $500 million. Winter Garden, one of the hardest hit locations, is only 50 miles from Hernando County. Other cities to feel the worst impact from this deadly outbreak of tornadoes are Altamonte Springs, Sanford, and Campbell.

On Ground Hog Day 2007 another deadly tornado event occurred across central Florida within Lake, Sumter and Volusia Counties during the early morning hours. A discontinuous swath of damage was observed from the town of Lady Lake (Lake County) to New Smyrna Beach (Volusia County) - a distance of over 70 miles.

A total of 21 fatalities occurred within Lake County. It is the deadliest tornado outbreak in Florida since the February 1998 outbreak and damage totaled to $204 million. This tornado was the very first tornado to be classified with the Enhanced Fujita Scale developed almost exactly a year prior to the event.

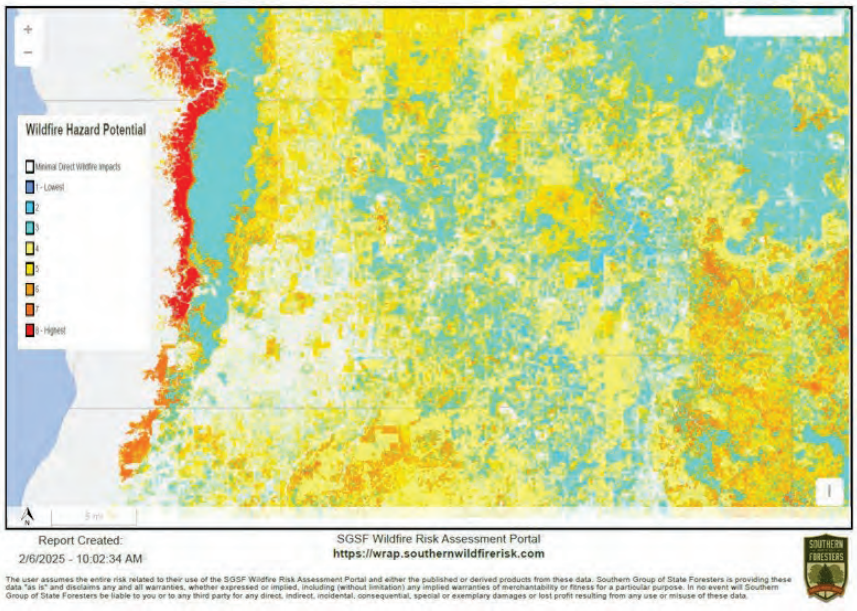
In 2018 an EF-1 tornado caused damage to 17 homes in Spring Hill. Officials stated that two of these homes suffered serious structural damage, but no injuries were reported. The National Weather Service stated that the tornado touched down for roughly three-fourths of a mile. Some of the homes on Lorendale Circle were directly in its path.[52]

Table 3-20 Vulnerability Scorecard

Frequency	Ranking of how often hazard occurred in the past. 3 - Very Likely: annually
Probability	Ranking of the likelihood of the hazard occurring in the future. 3 - Very Likely: annually
Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 2 - Medium: injuries recorded, but no deaths Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to the hazard occurrence. 2 - Medium: minor impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 1 - Low: little to no damage to environment recorded
Total Points	**11**

3.6 Wildfire

Hazard Profile Section	**Wildfire**
Description	A wildfire is an uncontrolled fire spreading through vegetative fuels, such as brush, marshes, grasslands, or field lands, exposing and possibly consuming structures. They often begin unnoticed and spread quickly and are usually signaled by dense smoke that fills the area for miles around. Wildfires may also be called forest fires. For the purpose of this analysis, the term wildfire will be used. The causes of these fires include lightning, human carelessness, and arson. An Urban-Wildland Interface fire is a wildfire in a geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels. Urban/wildland interface areas can be classified into the following types:

	The mixed interface contains structures that are scattered throughout rural areas. Usually, there are isolated homes surrounded by larger or smaller areas of land. An occluded interface is characterized by isolated (either large or small) areas within an urban area. An example may be a city park surrounded by urban homes trying to preserve some contact with a natural setting. A class interface is where homes, especially those crowded onto smaller lots in new subdivisions, press along the wildland vegetation along a broad front. Vast adjacent wildland areas can propagate a massive flame front during a wildfire, and numerous homes are put at risk by a single fire. In response to increasing demand for more accurate and up-to-date wildfire risk information, the Southern Group of State Forester (SGSF) embarked on a wildfire risk assessment for the entire Southeastern Unites States. The goal of the Southern Wildfire Risk Assessment (SWRA) project was to provide a consistent, comparable set of scientific results to be used as a foundation for wildfire mitigation and prevention planning in the Southern states. The SWRA data has been in use since, and Florida has undertaken updates in recent years. Products from SWRA incorporated into this LMS include the Wildland Urban
Location	The Wildland Urban Interface (WUI, Figure 3-9), Risk Index layer, is a rating of the potential impact of wildfire on people and their homes. The key input, WUI, reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the Wildland Urban Interface and rural areas is key information for defining potential wildfire impacts to people and homes. The range of values is from -1 to -9, with -1 representing the least negative impact and -9 representing the most negative impact. For example, areas with high housing density and high flame lengths are rated -9, while areas with low housing density and low flame lengths are rated -1. The total WUI region representing a 1-mile boundary around all conservation lands, forest areas, and communities within these buffer areas have the greatest exposure to wildland fire threats. The US Forest Service, in coordination with the State's Forest Service, conducted a community at risk assessment that identified a region or a community's exposure to wildland fire threats in the categories of low, medium, and high.  This assessment was updated in 2025 to reflect the county's communities at risk and their vulnerability ratings, as are listed in the table below. Based on the 2025 update,

<table>
<tr><td></td><td>Hernando County had 3 communities/regions rated at high risk and 3 rated as medium risk and one rated as low risk.</td></tr>
<tr><td>Extent</td><td>There have been several developed areas identified by the Florida Forestry Service as problem areas in addition to the CARS report. Those areas include the coastal communities and communities north along US19.
The average major fire burns approximately 210 acres or a little over ¾ of a square mile. As many as 45 homes (half the county average) could border the fire. Half of those homes could be in the fire's path — a total loss of 23 homes. Fires can be rated based on their fire danger rating, which indicates the predominant fuel types and their capacity to ignite and burn.</td></tr>
<tr><td>Previous Occurrences</td><td>
<table>
<tr><th>Year</th><th>#Fires</th><th>Acres Consumed</th></tr>
<tr><td>2020</td><td>24</td><td>575</td></tr>
<tr><td>2021</td><td>26</td><td>762</td></tr>
<tr><td>2022</td><td>23</td><td>964</td></tr>
<tr><td>2023</td><td>20</td><td>182</td></tr>
<tr><td>2024</td><td>17</td><td>507</td></tr>
</table>
Several tracts of the Withlacoochee Forest are in Hernando County. Two other sites of dense trees/brush are the Weeki Wachee and Chassahowitzka preserves. However, wildfires/brush fires have occurred in all parts of the County. Over the last thirty years, 1,541 fires have burned approximately 18,085 acres.
Also see section 3.6.2.</td></tr>
<tr><td>Probability</td><td>The majority of the county fuel types are grass and shrub beneath timber overstory. These types of fuels are predominantly light fuel, which makes them more susceptible to vegetative drying during drought conditions and increases the probability of ignition. Of the county's acres of drylands (which are typical of the major fuel type), nearly half of the lands are owned and managed by Federal, State, and County agencies. These agencies all conduct proactive fuel management programs, such as prescribed burning and mowing operations, to minimize the wildland fire hazards of the communities within the WUI areas.

However, the prolonged drought conditions over the past several years have increasingly limited their ability to conduct prescribed burn operations. As a result, the fuel loads within these areas have increased as well as the ignition probability from both human and natural causes.

During the period of 2020-2024, Hernando County experienced an average of 22 wildfires per year, based on the Withlacoochee Forestry Center dataset.

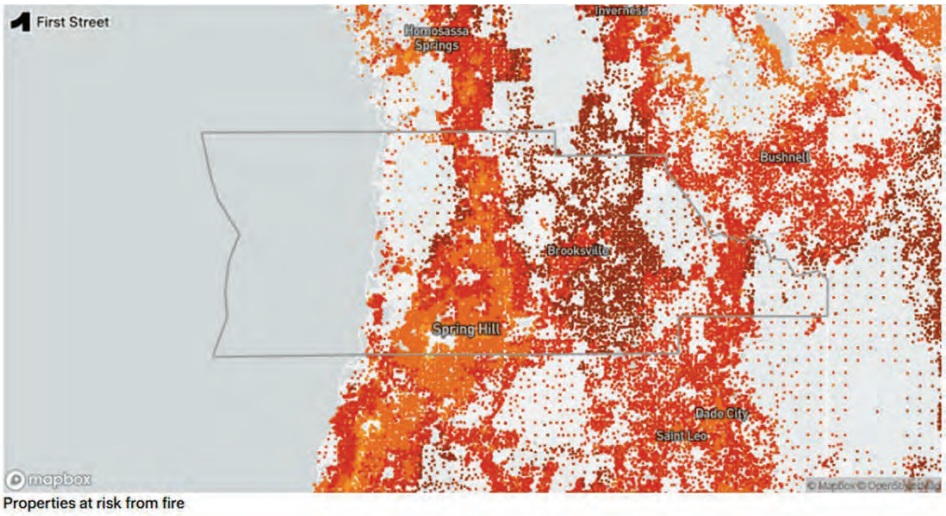
The probability of a wildfire affecting Hernando County, or the City of Brooksville, is Highly Likely with an annual probability of 100%.</td></tr>
</table>

Climate Change	Climate change, including increased heat, extended drought, and a thirsty atmosphere, has been a key driver in increasing the risk and extent of wildfires in the western United States during the last two decades. Wildfires require the alignment of a number of factors, including temperature, humidity, and the lack of moisture in fuels, such as trees, shrubs, grasses, and forest debris. All these factors have strong direct or indirect ties to climate variability and climate change.
Impacts	There have been several areas identified by the Florida Forest Service as potential problem areas. These areas include the Withlacoochee State Forest and the smoke-sensitive buffer areas along the major transportation routes. A significant number of people would be impacted by a wildfire, especially populations living or working in close proximity of the Withlacoochee State Forest, residents with asthma or other respiratory sensitivity, and very young and elderly residents. Wildfires and urban interface fires would have a great impact on the areas adjacent to the Withlacoochee State Forest, including the City of Brooksville, and coastal communities along the Weeki Wachee and Chassahowitzka Wildlife Management Areas. Figure (WUI Risk Index) above shows a rating of a negative impact on the WUI areas. As Hernando County and the City of Brooksville continue to grow, changes in development may impact the overall vulnerability from wildfire. Increases in population at the wildland and urban interface would increase risk to people living and working in these areas, as well as increase risk to their homes or businesses should a wildfire expand or jump into adjacent neighborhoods. Decreasing or implementing growth management buffers along the interface would help to decrease vulnerability to wildfire by maintaining a safer distance for development or a mitigation buffer between the wildland urban interface. *Public* Residents may experience injury or death during wildfires, possibly due to direct contact with fire, smoke inhalation, vehicle accidents due to decreased visibility because of smoke during evacuation. *First Responders* First, Responders may experience injury or death while suppressing wildfire (especially during high wind conditions), vehicle accidents due to decreased visibility, evacuation and rescue missions, or smoke inhalation. *Continuity of Operations* *Continuity of Operations* may be impacted during wildfire events leading to an inability to operate businesses if evacuations are ordered, leading to lost wages and revenue, Employee truancy (absenteeism) if employees are evacuated, or blocked transportation routes because of decreased visibility possibly affecting the delivery of services. *Property, Facilities, Infrastructure* Property, facilities, and infrastructure may experience damage or loss to personal structures or businesses, critical infrastructures such as schools, hospitals, government buildings, utilities, etc. or agricultural crops and timber, which leads to loss of income and revenue. *Environment* The environment may experience damage or loss to large, forested areas and habitats. *Economic Condition* Impacts to economic conditions include closures of businesses in evacuation areas leading to lost wages and revenue, Employee absenteeism leading to forced business closure which results in lost wages and revenue, Damage or losses to agricultural crops and timber, which leads to loss of income and revenue, and a loss of tourism if wildfires are in popular tourist areas. *Public Confidence* Public Confidence in a Jurisdiction's Governance may be affected by a loss of

	confidence if evacuations not ordered, messaged, and coordinated effectively, or if many deaths resulted from wildfires from those that did not evacuate.

Vulnerability	WUI housing density is categorized based on the standard Federal Register and U.S. Forest Service SILVIS data set categories, long considered a de facto standard for depicting WUI. However, in the SWRA WUI data the number of housing density categories is extended to provide a better gradation of housing distribution to meet specific requirements for fire protection planning activities. While units of the actual data set are in houses per sq. km., the data is presented as the number of houses per acre to aid with interpretation and use by fire planners in the South. In the past, conventional wildland urban interface data sets, such as USFS SILVIS, have been used to reflect these concerns. However, USFS SILVIS and other existing data sources do not provide the level of detail for defining population living in the wildland as needed by Southern state WUI specialists and local fire protection agencies. The SWRA WUI dataset is derived using advanced modeling techniques based on the SWRA Where People Live (housing density) dataset and 2012 LandScan population count data available from the Department of Homeland Security, HSIP Freedom Data Set. WUI is simply a subset of the Where People Live dataset. The SWRA WUI dataset is derived using advanced modeling techniques based on the SWRA Where People Live (housing density) dataset and 2012 LandScan population count data available from the Department of Homeland Security, HSIP Freedom Data Set. WUI is simply a subset of the Where People Live dataset. The primary difference between the WPL and WUI is that populated areas surrounded by sufficient non- burnable areas (i.e. interior urban areas) are removed from the Where People Live data set, as these areas are not expected to be directly impacted by wildfire. Simply put, the SWRA WUI is the SWRA WPL data with the urban core areas removed. Data is modeled at a 30-meter cell resolution, which is consistent with other SWRA layers. The following table shows the total population for each WUI area within the project area.[51] Based on this analysis provided by the Florida Fire Service, there are 157,976 people living in the WUI.

[51] Southern Wildfire Risk Assessment Summary Report. Hernando County



Properties at risk from fire

Minimal | Minor | Moderate | Major | Severe | Extreme

Residential: Major Risk ⓘ

85,979 out of 81,657 homes at risk

Infrastructure: Major Risk

133 out of 136 facilities at risk

Commercial: Major Risk ⓘ

3,095 out of 1,991 properties at risk

Social: Major Risk

164 out of 177 facilities at risk

Figure 3-9 - WUI Risk Index

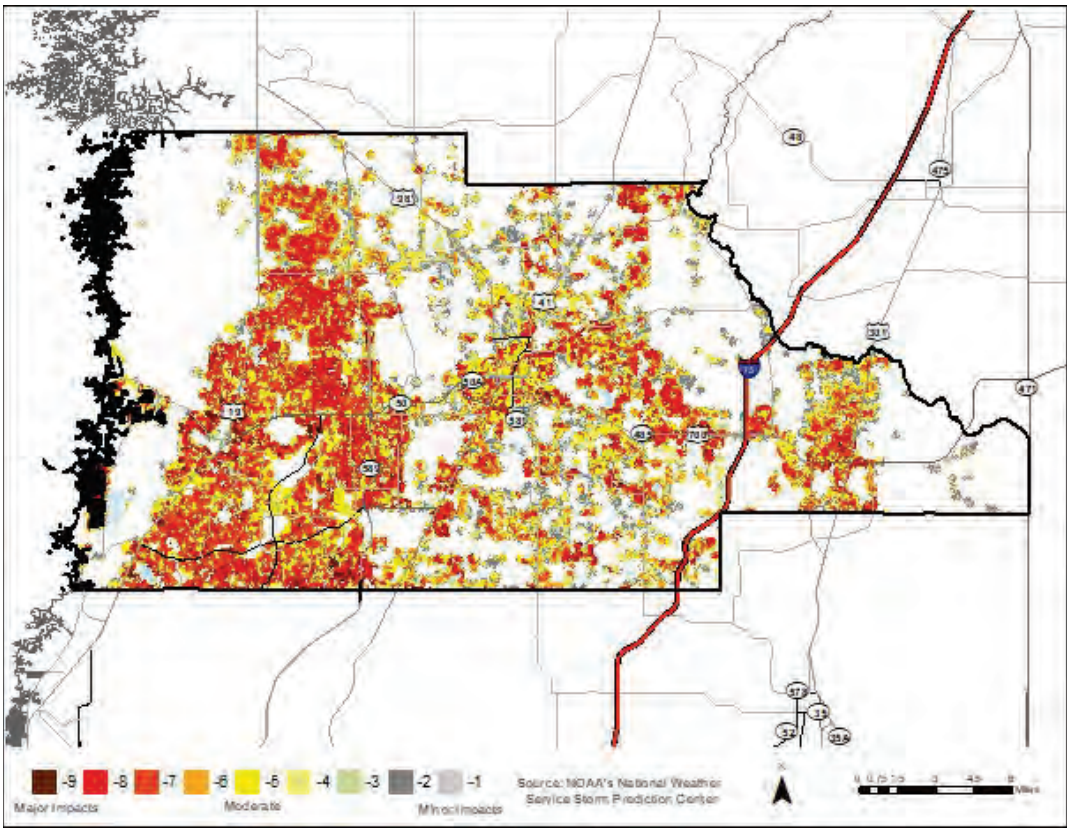


Table 3-26 - Hernando County Communities at Risk (CARs) as of 2025 Florida Forest Service Review

Communities	2017	2019	2024
Aripeka	Medium	High	High
Ayers	Medium	Medium	Medium
Bayport	High	High	High
Brookridge	Low	Low	Low
Brooksville	Low	Low	Low
Chaz (New 2019)		High	High
Cooglers Beach	High	High	High
Garden Grove	Medium	Medium	Medium
Glen Lakes	Medium	High	High
Hernando Beach	High	High	High
High Point	Medium	Medium	Medium
Hill N Dale	Medium	Medium	Medium
Istachatta	Low	Low	Low
Lake Lindsey	Low	Low	Low
Masarkytown	Medium	Medium	Medium
Nobleton	Low	Low	Low
Palm Grove	Medium	Medium	Medium
Pine Island	Medium	High	High
Ridge Manor Estates	Medium	Medium	Medium
Royal Highlands	Medium	Medium	Medium
Spring Hill	Low	Low	Low
Spring Lake	Low	Low	Low
The Heather	Medium	High	High
Timber Pines	Low	Low	Low
Weeki Wachee	Medium	High	High
Weeki Wachee Gardens	Medium	High	High
Wiscon	Low	Low	Low

3.6.1 Extent

The Water Tower Wildfire was the worst wildfire recorded in recent history (April 8, 2017) consumed 1,100 acres on state lands in Hernando Beach due to lightning. Ten homes and one church were threatened; however, none were lost. Therefore, the extent of wildfire is 1,100 acres. Extent can be determined by loss of property or threatened homes. The fire was closed out on May 12, 2017. Assisting agencies were Hernando County Fire Rescue and Pasco County Fire Rescue. Cooperating agencies were Hernando Emergency Management, Hernando Sheriff's Office and Salvation Army.

Table 3-27 – Fire Danger Rating Descriptions

Rating	Description
Low	Fuels do not ignite readily from small firebrands although a more intense heat source, such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands may burn freely for a few hours after rain, but wood fires spread slowly by creeping or smoldering and burn in irregular fingers. There is little danger of spotting.
Moderate	Fires can start from most accidental causes, but, with the exception of lightning fires in some areas, the number of starts is generally low. Fires in open cured grasslands will burn briskly and rapidly on windy days. Timber fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel, especially draped fuel, may burn hot. Short-distance spotting may occur but is not persistent. Fires are not likely to become serious, and control is relatively easy.
High	All fine dead fuels ignite readily, and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly, and short-distance spotting is common. High-intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are attacked successfully while small.
Very High	Fires start easily from all causes and immediately after ignition, spread rapidly, and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop intensity characteristics such as long-distance spotting and fire whirlwinds when they burn into heavier fuels.

3.6.2 Previous Occurrences

During the previous LMS period from 2010 until the summer of 2015, Hernando County has experienced, on an annual average, moderate drought conditions with occasional brief periods of severe drought. 2015-2019 the County has experienced above-average rainfall with the exception of 2017. The prolonged drought conditions have resulted in loss of surface water and exposure of bottomland. For the 2014-2019 time period, the county has experienced, on average, 24.4 wildland fires per year (Forest Service suppression actions only) based on the numbers provided by the Withlacoochee Forestry Center. Between 2014 and 2019, excluding prescribed fire, lightning, and incendiary were the most prevalent causes of wildfires that consumed the largest number of acres. Potential risks of wildfire include the destruction of land, property, and structures, as well as injuries and loss of life.

May 4th, 2008, a fire at Chassahowitzka Wildlife Management Area occurred. The Chassahowitzka fire started as a controlled burn of 250 acres. The escaped fire burned an additional 120 acres before it was brought under control.

In June 2009, a 1,400-acre wildfire occurred on Pine Island.

Between 1/1/09 to 3/17/09 there were 86 brush fires in Hernando County consuming approximately 180 acres and 131 unauthorized burns. Compared to the same period one year earlier, the figures nearly tripled (there were approximately 35 acres burned in the early part of 2008). On March 21, 2009, in eastern Hernando County, a 600-acre brush fire threatened at least 50 homes. As a result of the heavy smoke, roads were closed for much of the afternoon on March 22. Roads closed included S.R. 575, east of U.S. 301 and south of State Road 50, and a nine-mile stretch of S.R. 50 between U.S. 301 and S.R. 471. Eight crews, comprised of Hernando County Fire, Pasco County Fire, Sumter County Fire, and the Division of Forestry, created firebreaks between the blaze and dozens of houses along State Road 575 just east of Ridge Manor. A voluntary evacuation was ordered for a dozen homes. In two hours, the brush fire grew from 350 acres to

600.

On April 25, 2009, a sprawling fire just north of Aripeka and south of Hernando Beach forced a localized evacuation. The fire consumed nearly 100 acres and destroyed two structures and numerous vehicles. One structure contained irreplaceable art by a local artist. The 15 new canvasses were not insured; however, based on the artist's popularity and appeal and recent sales history, his exclusive dealer in New York estimated losses anywhere between several hundred and several million dollars.

The Water Tower Wildfire in Hernando Beach started April 8, 2017, by lightning and was 1100 acres on state land. 10 Homes and one Church were threatened, none lost. It closed out on May 12 2017. Assisting agencies were Hernando County Fire Rescue and Pasco County Fire Rescue. Cooperating agencies were Hernando Emergency Management, Hernando Sheriff's Office and Salvation Army. The Kingbird Wildfire started March 2, 2018, and burned 110 acres threatening 100 homes. 1 was destroyed, and 2 were damaged. The cause was human.

2017 was a high Wildfire Occurrence year for the state of Florida. Overall, from 2014 to 2019, impacts from wildfire included the destruction of structures, and forested land only, with no recorded injuries or loss of life.

Between 2015 and 2019 there were 122 Fires recorded by the Withlacoochee Forestry Center, consuming 2,281.6 acres.

The threat of wildfires cannot be eliminated; however, through public education and mitigation (using controlled/prescribed burns to eliminate/minimize the underbrush, which would contribute significantly to fueling flames), this hazard can be better managed. Because of these precautionary actions, the likelihood of a major wildfire is normally low to moderate. During periods of drought the probability increases from moderate to high.

3.6.3 Summary of Impacts

From 2014 to 2019, impacts from wildfire included the destruction of structures, and forested land only, with no recorded injuries or loss of life. Therefore, the impacts discussed in this section relate to possible future events. Often more devastating than the fire itself is the further impacts that develop from the wildfire event. Smoke and other emissions contain pollutants that can cause significant health problems. Short- term loss caused by wildfire can include the destruction of timber, habitats for wildlife, scenic landscapes, and watersheds. With the destruction of watersheds, the flooding vulnerability increases. Long-term effects include smaller timber harvests, reduced access to impacted recreational areas, and destruction of cultural and economic resources and community infrastructure. To those directly affected by the fire, the impact is significant. However, the economic impact would be extremely small.

Hazard Ranking

The LMS Planning Committee determined wildfire to be a high priority hazard in Hernando County. As described in the profile above, wildfire events within the county are common events with an annual probability of approximately 24.4 wildfires per year. Wildfire events may have a high range of impact.

The probable hazard magnitude for wildfire is high because of the potential for injury or death and less than a 24-hour warning time before the event. The table outlines the hazard rankings for each of the hazard priority criteria related to wildfire.

Table 3-28 – Vulnerability Scorecard

Frequency	Ranking of how often hazard occurred in the past. 3 - Very Likely: annually
Probability	Ranking of the likelihood of the hazard occurring in the future. 3 - Very Likely: annually
Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 1 - Low: no injuries or deaths recorded Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to the hazard occurrence. 2 - Medium: minor impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 2 - Medium: minor damage to environment recorded
Total Points	**11**

Figure 3-10 – Wildland Urban Interface (WUI) Density

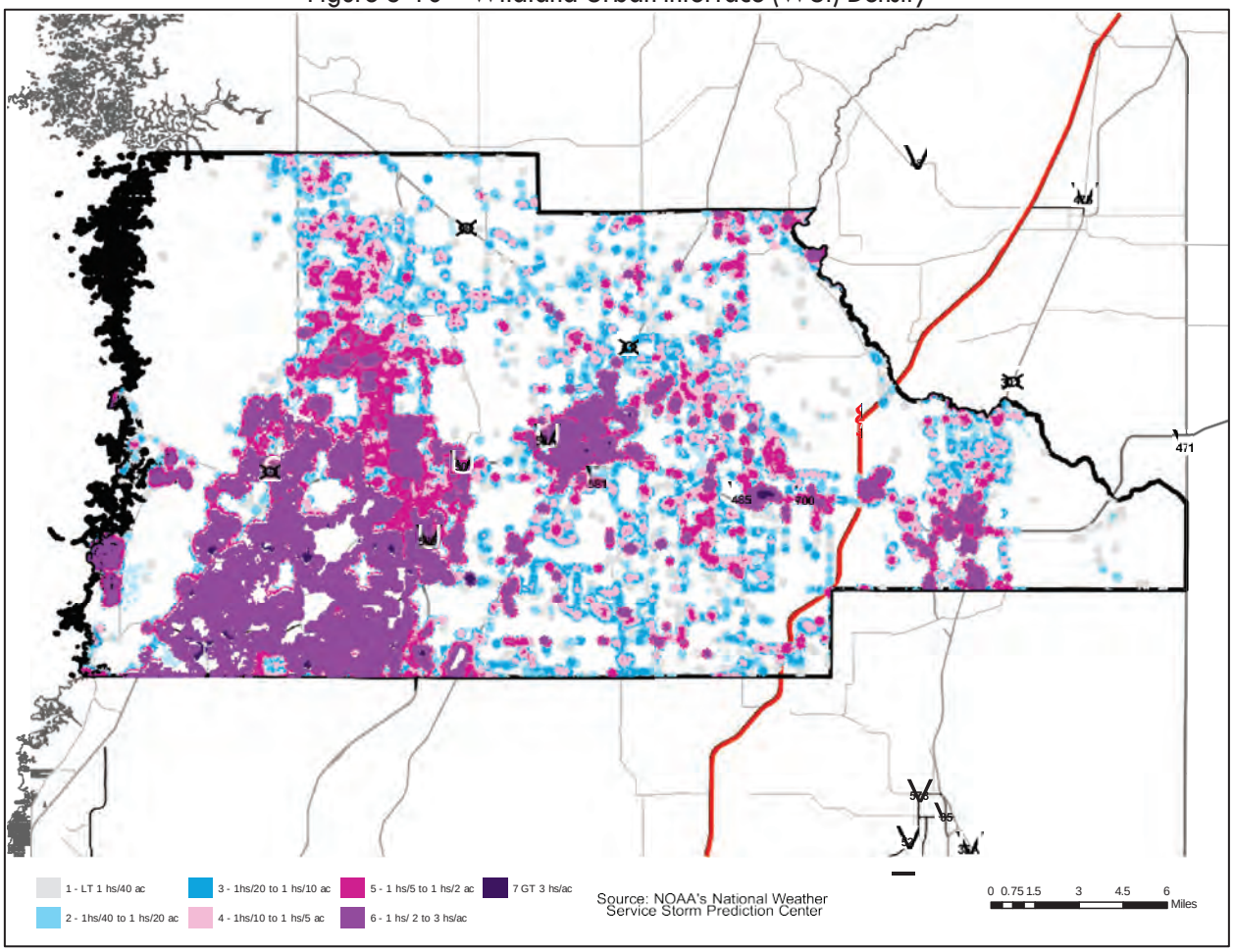


Table 3-29 - WUI Population[52]

	Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
	LT 1hs/40ac	364	0.2 %	25,337	15.3%
	1hs/40ac to 1hs/20ac	798	0.5 %	18,639	11.3%
	1hs/20ac to 1hs/10ac	2,472	1.6 %	23,153	14.0 %
	1hs/10ac to 1hs/5ac	5,918	3.7 %	24,167	14.6 %
	1hs/5ac to 1hs/2ac	16,331	10.3 %	28,362	17.2 %
	1hs/2ac to 3hs/1ac	123,784	78.4 %	44,522	27.0 %
	GT 3hs/1ac	8,309	5.3 %	913	0.6 %
	Total	**157,976**	**100.0 %**	165,093	100.0 %

According to property appraiser data there are 81,965 buildings located in the WUI area with a total building value of $4.1 billion.

Table 3-30 - Distribution of Structures in the WUI

Jurisdiction	Number of Properties within the WUI	Number of Buildings	Building Value (Improved Value)	Land Value
Hernando County (Unincorporated)	102,022	78,756	$ 8,888,684,193	$ 3,945,162,421
Brooksville	3,974	3,169	$ 381,914,575	$ 166,737,395
Weeki Wachee	18	40	$ 11,669,016	$ 34,900,163
Total	106,014	81,965	$9,282,267,784	$4,146,799,979

Due to the large geospatial extent, many of the critical facilities are located within the Wildland Urban Interface. Table 3-30 summarizes the other critical facilities that are in the flood hazard area.

Table 3-31 - Critical Facilities in WUI

	Unincorporated Hernando County	City of Brooksville	Total
Airports	1	0	1
Assisted Living Facilities & Nursing Homes	13	4	17
Electrical Substation	23	0	23
Fire Station	11	1	12
Government Building	15	13	28
Health Care Center	4	0	4
Schools & Shelters	24	4	27
Potable Water	5	0	5
Wastewater	18	1	19
Communication Towers	7	0	7

[52] Southern Wildfire Risk Assessment Summary Report. Hernando County

3.7 Erosion

3.7.1 Description

Coastal erosion is the wearing away of land or the removal of beach or dune sediments by wave action, tidal currents, wave currents, or drainage. Waves generated by storms cause coastal erosion, which may take the form of long-term losses of sediment and rocks, or merely in the temporary redistribution of coastal sediments. The study of erosion and sediment redistribution is called "coastal morphodynamics," which can be described also as the dynamic interaction between the shoreline, seabed, and water.

The ability of waves to cause erosion depends on a number of factors, which include:

- Erodibility of the beach, cliff, or rocks;
- Power of the waves to cross the beach;
- Lowering of the beach or shore platform through wave action; and
- Near shore bathymetry.

For example, waves must be strong enough to remove material from the debris lobe for erosion to occur. Additionally, beaches can help dissipate wave energy on the foreshore and can provide a measure of protection to cliffs, rocks, and other harder formations, as well as any area upland.

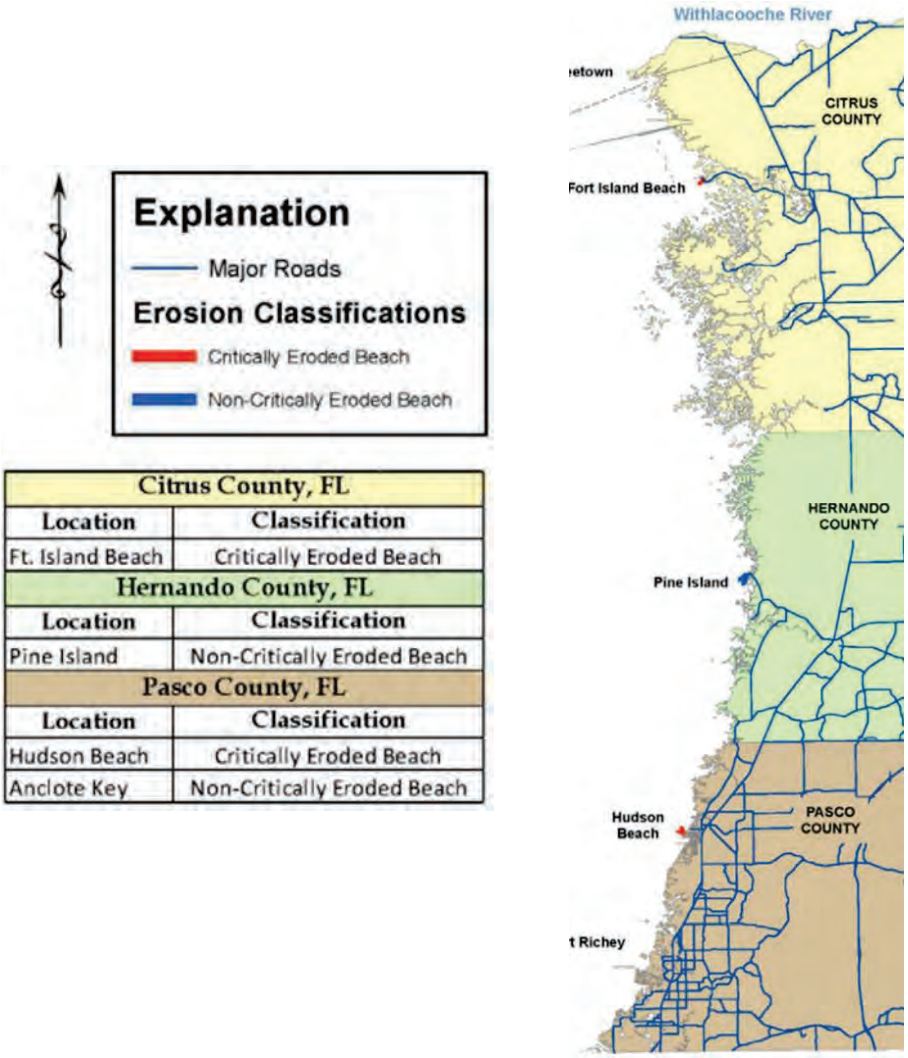
Some erosion changes are slow, inexorable, and usually gradual. However, the changes on a beach can happen overnight, especially during a storm. Even without storms, sediment may be lost to longshore drift (the currents that parallel coastlines), or sediment may be pulled to deeper water and lost to the coastal system. Coastal erosion may also be caused by the construction and maintenance of navigation inlets. There are over 60 inlets across Florida, many of which have been artificially deepened to accommodate commercial and recreational vessels. Jetties are also installed to prevent sediment from filling in these inlets. A consequence of this practice is that the jetties and inlets interrupt the natural flow of sediment along the beach, leading to an accumulation of sediment in the inlet and at jetty on one side of the inlet, and a loss of sediment to beaches on the other side of the inlet.[53]

FDEP identifies Pine Island and the area where erosion is the biggest concern in Hernando County, and the only previous occurrence of erosion across the jurisdictions in the past five years. FDEP identifies Pine Island as non-critically eroded.

Impacts to the City of Brooksville would likely be little to none, given the low probability of occurrence in that jurisdiction. In the small chance of increasing erosion in Pine Island, there are threats to public infrastructure in the area, some loss of land and related impacts to vulnerable ecosystems in the immediate vicinity, and potential impacts to tourism. Public safety, first responders, and impacts to governance are unlikely.

[53] Enhanced State Hazard Mitigation Plan, State of Florida, 2018

Figure 3-11 – Eroded Beaches in Citrus, Hernando and Pasco Counties



Citrus County, FL	
Location	**Classification**
Ft. Island Beach	Critically Eroded Beach
Hernando County, FL	
Location	**Classification**
Pine Island	Non-Critically Eroded Beach
Pasco County, FL	
Location	**Classification**
Hudson Beach	Critically Eroded Beach
Anclote Key	Non-Critically Eroded Beach

Hazard Ranking

The LMS Planning Committee determined coastal erosion to be a low priority hazard in Hernando County. As described in the profile above, the impacts of coastal within the county are geographically limited. Table 3-32 outlines the hazard rankings for each of the hazard priority criteria related to coastal erosion.

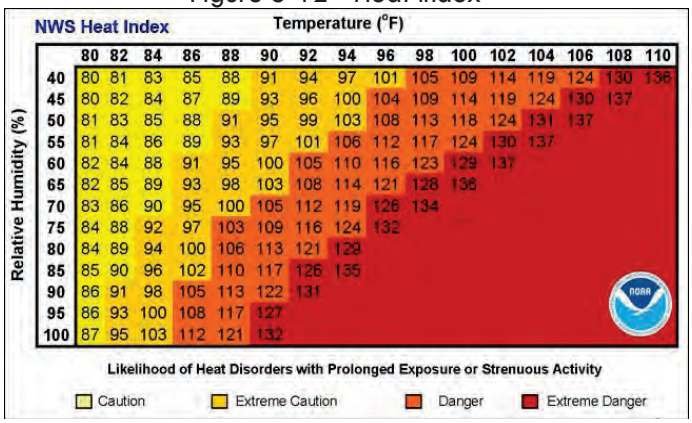
Table 3-32 – Vulnerability Scorecard

Frequency	Ranking of how often hazard occurred in the past. 1 - Not Likely: every 50-100 years
Probability	Ranking of the likelihood of the hazard occurring in the future. 1 - Not Likely: every 50-100 years
Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 1 - Low: no injuries or deaths recorded Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to the hazard occurrence. 1 - Low: little to no impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 1 - Low: little to no damage to environment recorded
Total Points	**5**

Due to the low probability of occurrence a vulnerability assessment will not be conducted for this hazard.

Should the probability of erosion events in Hernando County change in the future, the LMS Working Group will incorporate a full assessment of the hazard either at the required 5-year cycle review or post disaster.

3.8 Extreme Heat

Hazard Profile Section	Description
Description	Extreme heat is defined as extended period where the temperature and relative humidity combine for a dangerous heat index.[54] Extreme heat events occur across the state each year. This hazard is focused on the effects to the human population, while drought focuses more on environmental interests.
Location	Those areas of Hernando County, and especially the City of Brooksville, lying inland and away from the moderating influence of the coastal, lakes and river regions, would be more vulnerable to heat. Extreme heat can occur anywhere within the County, including the City of Brooksville and the City of Weeki Wachee. The spatial extent of an extreme summer heat event is Large, with between 50 and 100% of the area being affected.
Extent	*Heat Index* The Heat Index is a measure of how hot the temperature feels when humidity is factored in with the actual temperature. The Heat Index chart is below. The red area indicates extreme danger. The NWS will begin to issue alerts when the heat index is expected to exceed 105-110 degrees Fahrenheit for at least two consecutive days.[55] Figure 3-12 - Heat Index[56]  *Heat Related Illness* Extreme heat can cause death by making it difficult for a body to cool itself. Heat illnesses occur when the body temperature increases too quickly to cool itself or when too much fluid or salt is lost through dehydration or sweating. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat. Below are the different types of heat-related illnesses.[57] *Heat Cramps* Heat Cramps are the first sign of a heat illness and can lead to more serious illnesses. Symptoms of heat cramps include muscular pains and spasms, usually in the legs or abdomen.

[54] http://www.nws.noaa.gov/os/heat/index.shtml
[55] http://www.nws.noaa.gov/os/heat/heat_index.shtml
[56] Ibid.
[57] http://www.nws.noaa.gov/om/hazstats.shtml#

<table>
<tr><td></td><td><u>Heat Exhaustion</u>
Heat exhaustion follows heat cramps if the body is not able to cool itself. Symptoms include heavy sweating; weakness; cool, pale, clammy skin; a fast and weak pulse; dizziness; nausea or vomiting; and fainting.
<u>Heat Stroke</u>
Heat stroke usually occurs by ignoring the signs of heat exhaustion and is life-threatening. Signs of heat stroke include extremely high body temperature, red skin, changes in consciousness, rapid and weak pulse, rapid shallow breathing, confusion, vomiting, and seizures. This occurs because the body becomes overwhelmed by heat and begins to stop functioning. There are two types of heat stroke, classical and exertional. Classical heat stroke occurs when an individual is unable to maintain thermal equilibrium due to medication, injury, chronic illness, or age. Exertional heat stroke occurs when young and healthy individuals are engaged in strenuous activity in hot and humid weather.
Additionally, other chronic illnesses may become exacerbated by heat-related illnesses. For example, those with cardiovascular disease and other heart conditions may not be able to tolerate the increased cardiac output associated with heat illnesses. People with mental health disorders and certain behavioral disorders, such as substance abuse, are at higher risk for morbidity and mortality during extreme heat events. Those with respiratory diseases and Type I and II diabetes are also at higher risk for morbidity and mortality with increased heat exposure.[58]</td></tr>
<tr><td>Previous Occurrences</td><td>During the summer season, in warm climates, a heat wave can occur when an area of high pressure containing little or no rain or clouds, heats the air and ground to excess. When the high pressure area remains static, it results in a persistent heat wave. Heat waves have physical, psychological and environmental impact. The hazards associated with such events primarily affect very young or elderly residents.
Sustained episodes of high heat can result in illness and fatalities in susceptible populations. Given the demographic trends experienced in the county, this potential hazard is expected to increase. According to NOAA NCEI Storm Event Database no Excessive Heat events have been recorded in Hernando County.
The Brooksville Chin Hill Weather station recorded an average of 11.5 days with temperatures at or above 95 degrees per year.
Extreme Heat occurrences over the past five years are summarized below:
<table>
<tr><td>100 degrees</td><td>2020</td></tr>
<tr><td>96 degrees</td><td>2021</td></tr>
<tr><td>98 degrees</td><td>2022</td></tr>
<tr><td>100 degrees</td><td>2023</td></tr>
<tr><td>99 degrees</td><td>2024</td></tr>
<tr><td>100 degrees</td><td>Max</td></tr>
</table></td></tr>
<tr><td>Probability</td><td>Because of the high frequency of days with temperatures over 95 degrees recorded in Hernando county in the past, it is reasonable to assume that the county will experiences extreme heat days again in the future. The probability of an extreme heat event affecting Hernando County, the City of Brooksville is Likely, with an annual probability between 10 and 100%. As described above, Hernando County is likely to experience on average 11.5 days of temperatures above 95 degrees.</td></tr>
</table>

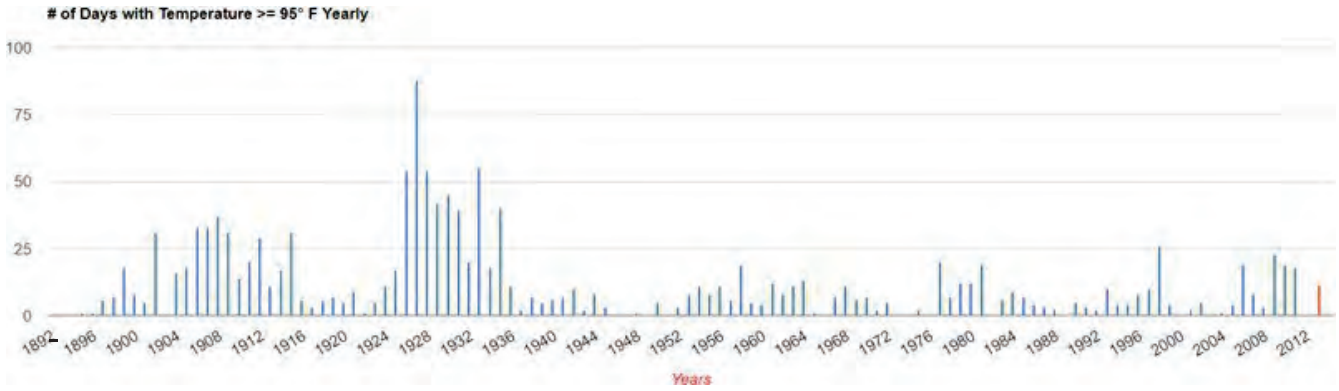
[58] https://www.flbrace.org/images/docs/heat-profile.pdf

Climate Change	Average global temperatures are expected to increase anywhere from 4 to 12 degrees Fahrenheit by the end of the 21st century.[59] Average global temperatures move in tandem with extreme temperatures, suggesting that in the future extreme heat events will become more frequent and last longer with an overall warming trend. According to analysis of 360 U.S. cities and the combination of several climate model projections, Florida will likely see an increase in days when the heat index is above 105 degrees Fahrenheit by 2050. Cities in Florida that are expected to experience these extreme temperatures in 2050, more often than they do now include Fort Meyers, Naples, Punta Gorda, Miami, Lakeland, Tampa, Sarasota, Port St. Lucie, Orlando, Vero Beach, Ocala, Palm Bay, and Gainesville.[60] Based on their proximity to these cities, Hernando County, Brooksville, and Weeki Wachee will likely also see an increase in extreme heat days. While it is likely that cycles of cool periods and warm periods will continue in the future, it is believed that the overall long-term trend is projected to be an increase in the number of extreme heat events.
Impacts	Impacts to the public, first responders, continuity of operations, property, facilities, infrastructure, environment, economic condition, and public confidence caused by extreme heat are generally the same for unincorporated Hernando County, the City of Brooksville, and the City of Weeki Wachee. *Public* Public impacts during an extreme heat event may include injury or death from overexposure, especially to infants, children, the elderly, those who are overweight, those with chronic illnesses, those who take certain medications. *First Responders* First responders could be at risk of injury or death from exertion in extreme heat. *Continuity of Operations* (including continued delivery of services) Extreme heat is not likely to impact continuity of operations. *Property, Facilities, Infrastructure* Facilities may be affected by extreme heat events especially if they have less efficient cooling systems or systems that must run constantly to effectively cool a building. *Environment* Environmental impacts may include faster evaporation, damage to green spaces and agricultural lands, and the death of plants and animals. *Economic Condition* Economic impacts related to extreme heat may include loss of tourism due to the risk of negative health outcomes during summer months. *Public Confidence in the Jurisdictions Governance* If people become ill or die from exposure to extreme heat, the public may believe the government is not doing all that it can to help those in need, especially if cooling shelters were not opened.

[59] https://nca2018.globalchange.gov/chapter/2/
[60] http://www.climatecentral.org/news/sizzling-summers-20515

Vulnerability	The previous update of the LMS considered the effects of extreme heat on humans and the environment together. Based on updates to the Statewide Mitigation Strategy, this hazard has been revised to focus on the effects to the human population, while drought focuses more on environmental interests. *Population* Transient, low or fixed income and elderly populations are at the greatest risk from extreme heat. According to the 2017 America Community Survey, 14.3% of the population of Hernando County is below the poverty level. According to the ACS the median age is 48.9 with 12.6% of the population being over the age of *Property* In that extreme heat is a regional issue, the impacts from this hazard will generally affect the entire county in the same manner and would not result in structural damages; therefore, specific building counts are not available to assess the vulnerability of assets for this hazard. *Critical Facilities* Due to the broad geographic extent of an extreme heat event it is difficult to identify specific facilities that would be vulnerable. Extended periods of extreme heat could also affect the power grid due to high demand for air conditioners.

Figure 3-13 - Days with Temperature >=95 degrees F Yearly[61]



Hazard Ranking

The LMS Planning Committee determined extreme heat to be a moderate priority hazard in Hernando County. As described in the profile above, the annual probability of an extreme heat event is high, however the impacts are limited to the effects on people rather than buildings and infrastructure. Table 3-33 outlines the hazard rankings for each of the hazard priority criteria related to extreme heat.

Table 3-33 – Vulnerability Scorecard

Frequency	Ranking of how often hazard occurred in the past. 2 - Likely: every 5-10 years
Probability	Ranking of the likelihood of the hazard occurring in the future. 2 - Likely: every 5-10 years

[61] https://climatecenter.fsu.edu/climate-data-access-tools/climate-data-visualization

Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 2 - Medium: injuries recorded, but no deaths Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to the hazard occurrence. 1 - Low: little to no impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 1 - Low: little to no damage to environment recorded
Total Points	**8**

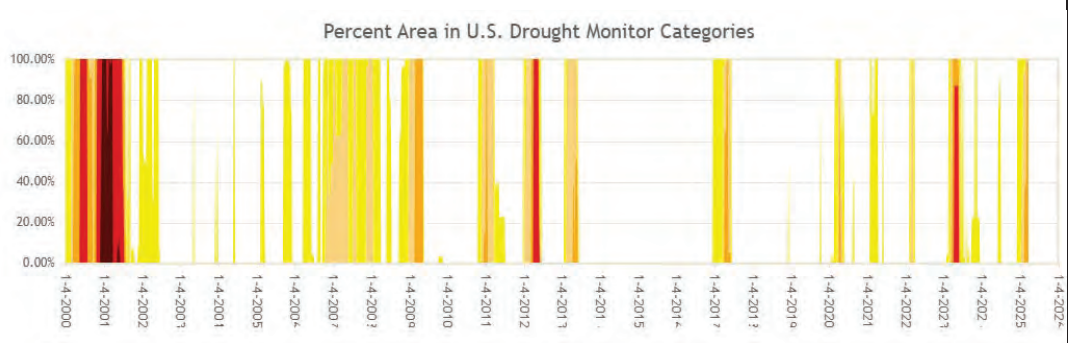
3.9 Drought

Hazard Profile Section	**Drought**
Description	Drought is a condition of climatic dryness severe enough to reduce soil moisture and water and snow levels below the minimum necessary for sustaining plant, animal, and economic systems. Drought is a complex physical and social process of widespread significance. It is not usually statewide phenomena as differing conditions in the State often make drought a regional issue. Despite all of the problems that droughts have caused, it is difficult to define and there is no universally accepted definition because drought, unlike floods, is not a distinct event. Drought are often the result of many complex factors such that it often has no well- defined start nor end and the impacts vary by affected sector, thus, often making definitions of drought specific to particular affected groups. The most commonly used drought definitions are based on meteorological, agricultural, hydrological, and socioeconomic effects.[62] • **Meteorological** drought is often defined by a period of substantially diminished precipitation duration and/or intensity. The commonly used definition of meteorological drought is an interval of time, generally on the order of months or years, during which the actual moisture supply at a given place consistently falls below the climatically appropriate moisture supply. • **Agricultural** drought occurs when there is inadequate soil moisture to meet the needs of a particular crop at a particular time. Agricultural drought usually occurs after or during meteorological drought, but hydrological drought can also affect livestock and other dry-land agricultural operations. • **Hydrological** drought refers to deficiencies in surface and subsurface water supplies. It is measured as streamflow, snowpack, and as lake, reservoir and groundwater levels. There is usually a delay between lack of rain or snow and less measurable water in streams, lakes, and reservoirs. Therefore, hydrological measurements tend to lag behind other drought indicators. • **Socioeconomic** drought occurs when physical water shortages start to affect the health, well-being, and quality of life of the people, or when the drought starts to affect the supply and demand of an economic product.
Location	Drought is equally likely to occur anywhere within the County, including the City of Brooksville. The spatial extent of a drought event is Large, with between 50 and 100% of the area being affected. Areas within Hernando County and its jurisdiction that are most likely to be most impacted from a severe drought are areas where there are acres

[62] https://drought.unl.edu/Education/DroughtIn-depth/TypesofDrought.aspx

	of hay. There are currently 4,398 acres of hay in drought in Hernando County; areas of haylage, and other large agricultural areas including areas with cattle land and sheep.
Extent	U.S. Drought Monitor Classification Scheme is a commonly used index that identifies general drought areas, labelling droughts by intensity, with D1 being the least intense and D4 being the most. One method to interpret drought is the Palmer Drought Severity Index (PDSI), which is based on the supply and demand concept of the water balance equation, taking into account more than just the precipitation deficit at specific locations. The drought severity classification table (Table 3-34) shows the ranges for each indicator for each dryness level. Because the ranges of the various indicators often don't coincide, the final drought category tends to be based on what the majority of the indicators show and on local observations. The analysts producing the map also weigh the indices according to how well they perform in various parts of the country and at different times of the year. Additional indicators are often needed in the West, where winter snowfall in the mountains has a strong bearing on water supplies. It is this combination of the best available data, local observations and experts' best judgment that makes the U.S. Drought Monitor more versatile than other drought indicators. Short-term drought indicator blends focus on 1-3 month precipitation. Long- term blends focus on 6-60 months. Additional indices used, mainly during the growing season, include the USDA/NASS Topsoil Moisture, Keetch- Byram Drought Index (KBDI), and NOAA/NESDIS satellite Vegetation Health Indices. Indices used primarily during the snow season and in the West include snow water content, river basin precipitation, and the Surface Water Supply Index (SWSI). Other indicators include groundwater levels, reservoir storage, and pasture/range conditions.[63] Figure 3-33 is an example of the U.S. Drought Monitor for Florida in December of 2019. The worst period of drought in Hernando County was categorized as D4, therefore D4 Exceptional Drought is the extent of drought.
Previous Occurrences	According to the US Drought Monitor, from 2019 through 2024, the months of January through June had drought conditions, while July through December typically did not suffer drought conditions.[64] In 2011, drought conditions varied weekly from Severe Drought (D2) in January, to Abnormally Dry (D0) in June (see Figure below). Drought conditions were more severe in 2012, as conditions peaked at Extreme Drought (D3) for four weeks in May (see Figure below). In 2013, Extreme Drought (D3) was experienced in the northern part of the County for five weeks in April and May. From late December 2016 through mid-June of 2017, Hernando County experienced Moderate (D1) to Severe (D2) drought conditions.74 Because these periods of drought conditions were not prolonged, drought impacts were not measurable. From 2020 to 2024 most years were abnormally dry, with a period of Extreme Drought (D3) in January of 2024.

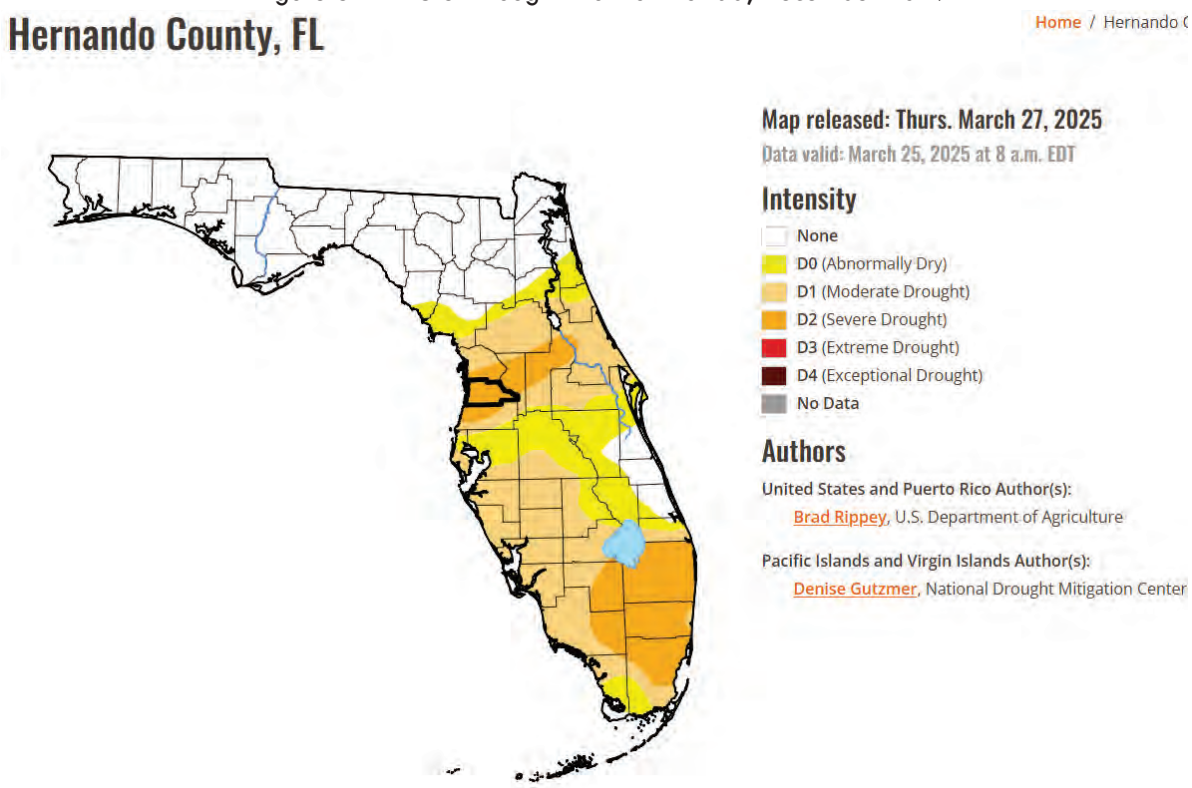
[63] https://droughtmonitor.unl.edu/AboutUSDM/AbouttheData/DroughtClassification.aspx
[64]https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?fips_12053

	
Probability	Historically, Hernando County has experienced periodic drought conditions; however, they were usually not of such a prolonged nature. Past climatic patterns of prolonged La Nina conditions within the Pacific region has resulted in the county's more dry local weather conditions and these conditions are expected to repeat. The probability of a drought event affecting Hernando County or the City of Brooksville is Likely, with an annual probability between 10 and 100%.
Climate Change	Changes in rates of precipitation, evaporation, and transpiration, may affect the duration and severity of drought events. A warmer climate would impact the hydrological cycle by increasing rates of evaporation leading to a decrease in runoff rates associated with rainfall events. Moreover, increased rates of evapotranspiration would exacerbate current droughts as existing soil moisture and plant moisture would likewise increase moisture in the atmosphere potentially leading to more frequent rainfall events. The hydrologic cycle is expected to intensify in a warming future, where the frequency and severity of extreme drought and rainfall increase, the combination dramatically transforming ecosystems in the region.[65] It is widely believed that an overall warming trend may intensify and prolong droughts as they occur due to increased rates of evapotranspiration associated with higher temperatures.[66] The Intergovernmental Panel on Climate Change forecasts with medium confidence both an increase in heavy rainfall periods as well as an increase in the duration of relatively dry periods for North America, particularly in the subtropics, such as Florida.[67] South Florida, in particular, may see increased dry and hot periods between heavy rainfall events, exacerbating the risk for drought.[68] However, there is significant uncertainty associated with these projections given the numerous factors that contribute to climatic variability.[69] As stated in the flood hazard profile, the expected global pattern is for arid areas to become drier, meaning that droughts may occur more frequently and be more severe.

[65] https://nca2018.globalchange.gov/chapter/19/
[66] https://www.ipcc.ch/pdf/specialreports/srex/SREX_FD_SPM_final.pdf, p. 13).
[67] https://www.ipcc.ch/pdf/special-reports/srex/SREX-Chap3_FINAL.pdf
[68] https://nca2018.globalchange.gov/chapter/19/
[69] http://journals.ametsoc.org/doi/full/10.1175/2009JCLI2683.1

Impacts	Impacts to the public, first responders, continuity of operations, property, facilities, infrastructure, environment, economic condition, and public confidence caused by drought are generally the same for unincorporated *Public* Drought impacts for the public may include a lack of water or water restrictions for personal use. Residents may also experience damage to property, such as grass and other vegetation dying from a lack of water. Lack of water or water restrictions may impact the public use of water and wastewater utilities; the public may have to restrict their showering time and other water use in the restroom, restrict their water usage for cooking and drinking, and restrict from watering their gardens or lawns. *First Responders* First responders may experience a lack of water to extinguish fires. Publicly owned property, such as green spaces, gardens, crops, etc. may be damaged from lack of water. Continuity of Operations (including continued delivery of services) Lack of water or water restrictions may impact the public use of water and wastewater utilities the public may have to restrict their showering time and other water use in the restroom, restrict their water usage for cooking and drinking, and restrict from watering their gardens or lawns Property, Facilities, Infrastructure Facilities and infrastructure should not be affected by drought. Property, such as green spaces, gardens, and crops may be damaged from lack of water *Environment* Environmental impacts may include loss of vegetation and damage to forests from drought. In addition to straining water supplies and lowering lakes and rivers, the lack of rain could mean a more severe wildfire season that peaks in April and May, when temperatures rise and plants dry. Many of the county's smaller lake and pond resources as well as wetland areas may experience loss of surface waters and exposure of the bottom beds, the majority comprised of dead vegetative peat or muck layers. These areas were now exposed to increased human encroachment, lightning strike exposure and wildland fire occurrence rates. *Economic Condition* Economic impacts may include crop damage or loss from drought can severely impact farmers and the agricultural economy, which can in turn affect the economy of an area if it is dependent upon the sales of the crops. Employment loss may be a result of drought due to lower demand for services such as landscaping, lawn care, car wash, etc. *Public Confidence* The public may lose confidence in the jurisdiction's governance if there is not a plan in place to deal with lack of water or water restrictions.
Vulnerability	The LMS Planning Committee determined drought to be a moderate priority hazard in Hernando County. As described in the profile above, the annual probability of a drought event is Likely, however the impacts are limited and generally affect vegetation rather than buildings and infrastructure Agricultural areas may be more vulnerable to drought. According to the 2040 Hernando County Comprehensive Plan, there are 79,199 acres of agricultural land accounting for 24.4% of the overall land in the county. Historic occurrences of drought events have resulted in crop losses, job losses, and lost revenue

Figure 3-14 - U.S. Drought Monitor Florida, December 2019[70]



The objective of the Palmer Drought Severity Index (PDSI), is to provide measurements of moisture conditions that are standardized so that comparisons using the index can be made between locations and between months.

The U.S. Drought Monitor map identifies areas of drought and labels them by intensity. D1 is the least intense level and D4 the most intense. Drought is defined as a moisture deficit bad enough to have social, environmental or economic effects. D0 areas are not in drought, but are experiencing abnormally dry conditions that could turn into drought or are recovering from drought but are not yet back to normal. Drought Intensity categories are based on the original five key indicators along with several dozen other objective indicators, local condition reports and impact reports from more than 450 expert observers around the country, and drought impacts which subjectively support and validate the indicators used.

[70] https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?fips_12053

Table 3-34 – Drought Classification

			Ranges				
Category	**Description**	**Possible Impacts**	**Palmer Drought Severity Index (PDSI)**	**CPC Soil Moisture Model (Percentiles)**	**USGS Weekly Streamflow (Percentiles)**	**Standardized Precipitation Index (SPI)**	**Object Drought Indicator Blends (Percentiles)**
D0	Abnormally Dry	**Going into drought:** short-term dryness slowing planting, growth of crops or pastures **Coming out of drought:** some lingering water deficits pastures or crops not fully recovered	1.0 to - 1.9	21 to 30	21 to 30	-0.5 to -0.7	21 to 30
D1	Moderate Drought	Some damage to crops, pastures Streams, reservoirs, or wells low, some water shortages developing or imminent Voluntary water-use restrictions requested	-2.0 to - 2.9	11 to 20	11 to 20	-0.8 to -1.2	11 to 20
D2	Severe Drought	Crop or pasture losses likely Water shortages common Water restrictions imposed	-3.0 to - 3.9	6 to 10	6 to 10	-1.3 to -1.5	6 to 10
D3	Extreme Drought	Major crop/pasture losses Widespread water shortages or restrictions	-4.0 to - 4.9	3 to 5	3 to 5	-1.6 to -1.9	3 to 5
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses Shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less	0 to 2	0 to 2	-2.0 or less	0 to 2

Table 3-35 outlines the hazard rankings for each of the hazard priority criteria related to drought.

Table 3-35– Vulnerability Scorecard

Frequency	Ranking of how often hazard occurred in the past. 2 - Likely: every 5-10 years
Probability	Ranking of the likelihood of the hazard occurring in the future. 2 - Likely: every 5-10 years
Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 1 - Low: no injuries or deaths recorded Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to the hazard occurrence. 1 - Low: little to no impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 2 - Medium: minor damage to environment recorded
Total Points	**8**

3.10 Geological

Hazard Profile Section	Geological
Description	This profile will discuss landslides and sinkholes. In the 2013 update, the SHMP combined sinkholes, landslides and earthquakes. For the 2018 update, Mitigate FL decided to keep landslides and sinkholes together and re-name the profile Geological Events, and create a new hazard named Seismic, and that convention stands for this most recent update. *Landslides* The State of Florida has very low topographic relief, meaning that the state is flat. Because of this, landslides are not a significant natural hazard in Florida, and the same is true of Hernando County.[71] No landslide events have been recorded in Hernando County, and any risk or vulnerability to people, property, the environment, or operations would be low. As such, landslides will not be assessed further in this section. *Sinkholes* Sinkholes are landforms created when overburden subsides or collapses into fissures or cavities in underlying carbonate rocks. Florida is underlain by several thousand feet of carbonate rock, limestone, and dolostone, with a variably thick mixture of sands, clays, shells, and other near surface carbonate rock units, called overburden. Those several thousand feet of carbonate rocks are host to one of the world's most productive aquifers, the Floridian aquifer system. Erosional processes, physical and chemical, have created fissures and cavities within the rock. This has created Florida's karst topography, characterized by the presence of sinkholes, swallets, caves, submerged conduits, springs, and disappearing and reappearing streams. Sinkholes are unpredictable, as they can form rapidly, within minutes to hours, or slowly, within months to years.[72] This profile will focus on the two common types of sinkholes in Florida, cover collapse sinkholes and cover subsidence sinkholes, because of their rate of formation and the risk they pose to human life and property. *Cover Collapse Sinkholes* Cover-collapse sinkholes may develop quickly and cause significant damage. These sinkholes develop when the ceiling of an underground cavity can no longer support the overlying weight, resulting in an abrupt collapse of the overburden into the cavity, thereby forming a hole in the land surface.[73] This occurs because over time, surface drainage, erosion, and deposition of materials develop a shallow bowl-shaped depression beneath the surface of the ground. *Cover Subsidence Sinkholes* Cover-subsidence sinkholes develop more gradually, usually where the sediment is permeable and contains sand. The overburden slowly migrates down into the fissures and cavities in the underlying rock, which results in a depression in the land surface.[74] *Triggers* There are several triggers for sinkhole formation. For example, extended periods of

[71] http://www.dep.state.fl.us/geology/geologictopics/hazards/landslides.htm
[72] Florida Department of Environmental Protection Florida Geological Survey. (2017). The favorability of Florida's geology to sinkhole formation
[73] Ibid.
[74] Ibid.

	drought can lead to sinkholes, especially if a heavy rain event occurs after an extended drought. Heavy rainfall can trigger sinkholes for several reasons. For example, heavy rainfall can add additional weight to overburden sediments above a cavity which could cause a failure of the cavity ceiling. Or heavy rainfall could collect in low lying areas adding to the weight and accelerating infiltration at that location, which could cause failure of cavity ceilings. Additionally, heavy rainfall could saturate overburden sediments, making them soft, which could weaken the overburden sediments, causing failure of the cavity ceiling (sink report, 10). According to geologists, sinkholes can also be attributed to anthropogenic triggers, such as significant groundwater withdrawal; terraforming, which is the alteration of the earth's surface without realizing the area has thin overburden sediments; some stormwater management practices; heavy infrastructure over critical areas; and well drilling and development.[75]
Location	No landslide events have been recorded in Hernando County or the City of Brooksville and any risk or vulnerability to people, property, the environment, or operations would be low. Hernando County developed a permit process for investigating sinkhole or ground settlement activity. Much of the reported activity has been located in the southwest part of the County. Figure 3-15 shows the distribution of reported sinkholes in Hernando County and the sinkhole area types. The county is located in Area I, II and III as defined by the Florida Geological Survey. Area I consists of bare or thinly covered limestone. Sinkholes are few, generally shallow and broad and develop gradually. Solution sinkholes dominate. Area II consists mainly of incohesive and permeable sand. Sinkholes are few, shallow, of small diameter and develop gradually. Cover-subsidence sinkholes dominate. Area III consists mainly of cohesive clayey sediments of low permeability. Sinkholes are most numerous, of varying size and develop abruptly. Cover- collapse sinkholes dominate. The spatial extent of a sinkhole event is Small, with between 1 and 10% of the area being affected.
Extent	No landslide events have been recorded in Hernando County or the City of Brooksville, and any risk or vulnerability to people, property, the environment, or operations would be low and limited in extent. The length and width details for sinkholes are used to determine the extent of impacts. The following scale was used to rank the size of the sinkholes. All sinks ranging from: • 1' to 19' = Small • 20 to 39' = Medium • 40' and larger = Large Although the majority of reported sinkholes in Hernando County are small, the extent is 200 feet in width, as the largest recorded sinkhole in the county was 200 feet in length and width and 100 feet in depth on May 30, 1974.

[75] Florida Department of Environmental Protection Florida Geological Survey. (2017). The favorability of Florida's geology to sinkhole formation

Previous Occurrences	No previous occurrences in the last five years of landslides in Hernando County or in the City of Brooksville. The Subsidence Incident Reports database was started by the Florida Geological Survey (FGS) for scientific research purposes only. In the early 1980s, the database was moved to the newly formed and legislatively mandated Florida Sinkhole Research Institute (FSRI); however, in the early 1990s FSRI was eliminated, and the database came back to the FGS. There was never a legal requirement that sinkhole occurrences or sinkhole insurance claims be entered into the database. Before being transferred to FSRI, the data collected came from citizens reporting sinkholes, cities, counties, and FDOT all voluntarily. FSRI did make an effort to increase the number of records entered into the database while it was under their tenure, but even those records were voluntary. Currently, a majority of the records come from the State Watch Office, which is the clearing house for emergency response calls involving man-made and natural disasters. The State Watch Office has a special reporting form that county, city and state dispatchers fill out (should they choose too) if a call comes in regarding a possible sinkhole occurrence. The second source is from citizens who either fill out and submit a Subsidence Incident Report form (via mail, email, fax) or by calling the FGS. The third source is via emergency situations where a swarm of sinkholes occurs and the FGS is called in by emergency officials to help survey the sinkhole hazard, such as after Tropical Storm Debby or the January 2010 frost/freeze event in the Plant City area. There are some records in the database that are associated with sinkhole insurance claims; however, those represent a small fraction of the total reports. On July 12, 2001, emergency officials for Hernando County investigated 18 confirmed sinkholes that hit in one day across the area, affecting a residential area consisting of roughly 15 to 16 blocks and causing extensive damage to one house. One of the largest holes measured between 50 and 100 feet deep. In June 2002 a Spring Hill woman saw a 40-foot-wide hole open in a retention area behind her uninsured home. The Southwest Florida Water Management District blamed the 2001 outbreak on weather conditions: a prolonged drought dropped groundwater levels and opened spaces in the limestone, followed by heavy summer rains that weighed down the covering layer of soil. On March 3, 2006, six sinkholes cracked roads, swallowed the back end of a cement truck and threatened the stability of as many as 10 homes in a southwest Hernando County neighborhood of Spring Hill. The first sinkhole tore a 40-foot gash in the ground. Then another appeared across the street, and still another on a nearby property. One sinkhole appeared in front of a residential structure that was undergoing remediation of a sinkhole. By the end of the day, the sinkholes forced four families to evacuate and rattled other residents in an area already reeling from hundreds of sinkholes and the corresponding spike in insurance rates. The sinkholes appeared within 1,000 yards of each other. On June 24, 2012, heavy rainfall of over 8 inches from Tropical Storm Debby fell across the entire county, with the highest storm total of 16.47 inches reported at the CoCoRaHS site near High Point. The storm impacted 1,190 individuals and businesses. At least 83 sink holes opened up as a result of the rain, including one on a runway at the county airport. The total damage to public property as a result of the storm was approximately $945,900 (Hernando County Public Assistance Request). In 2014, sinkholes affected residential areas in Spring Hill. Four homes in the Trillium subdivision were affected by a sinkhole opening. [76] According to the Florida Department of Environmental Protection's Subsidence Incident Report Database, there have been 290 sinkholes reported in Hernando County between

[76] https://www.nationalgeographic.com/news/2014/7/140724-sinkhole-pictures-photos-geology-science/

	1965 and May 2018. Based on the data acquired, the reported sinkholes are broken out to reveal that of the 290 sinks, 189 sinks fall within the small category, 30 are medium, and 13 are Large. The remaining 58 sinks could not be categorized due to insufficient dimensional data (Figure 3-15). According to the most recend date from the Subsidence Incident Report Database, between 2018 and 2023 there were 13 sinkholes reported across the County, including two in the City of Brooksville. Most reports occurred between US-19 and Suncoast Parkway S. The sinkholes fell into the following size classifications: nine were categorized as small, two were medium, and two large.
Probability	No previous occurrences in the last five years of landslides in Hernando County or in the City of Brooksville, therefore the probability of a landslide occurring in the jurisdictions would be low, between 0% and 10% a year. Sinkholes can be triggered by natural and anthropogenic factors, such as heavy rain after an extended drought and groundwater withdrawal or well drilling. This means that heavy rainfall or high levels of groundwater withdrawal can increase the probability of sinkholes in an area. Additionally, as population increases, the potential for individuals to be negatively impacted by a sinkhole increases because more people will live in locations that are favorable for sinkhole development.[77] Based on the information contained in the Subsidence Incident Reports database, there were 13 subsidence incidents reported between January 2014 and May of 2018. This would mean that the county has a recurrence interval of approximately 3 sinkholes in any given year. The probability of a sinkhole event affecting Hernando County, or the City of Brooksville is Highly Likely, with an annual probability of 100%. Since 2019 there has been one subsidence incident report. 28.55617900 x -82.46849030 Hernando County, Florida
Climate Change	Incidences of sinkholes increase either after severe storm events with associated flooding and soil saturation or during extended periods of drought.[78] With the potential for more prolonged and more intense periods of drought as well as greater intensity and frequency of rainfall and inland flooding, it is likely that incidences of sinkholes will increase in the coming century in areas with karst geology or areas identified as favorable for sinkhole development.
Impacts	Impacts to the public, first responders, continuity of operations, property, facilities, infrastructure, environment, economic condition, and public confidence caused by sinkholes and landslides are generally the same for unincorporated Hernando County and the City of Brooksville. *Public* Impacts to the public include the possibility of falling or driving into a sinkhole. Members of the public are also at risk of injury or death from structural collapse caused by sinkholes. Additionally, the public could be impacted by an increased risk to the aquifer water supply. A hazardous materials spill in the vicinity of a major sinkhole during a storm event could endanger drinking water supply.[79]

[77] Florida Department of Environmental Protection Florida Geological Survey. (2017). *The favorability of Florida's geology to sinkhole formation*

[78] Dragoni and Sukhija (2008) Climate change and groundwater: A short review. Geological Society, London, Special Publications, 288, 1-12; Hyatt and Jacobs (1996). Distribution and morphology of sinkholes triggered by flooding following Tropical Storm Alberto at Albany, Georgia, USA. Geomorphology, 17, 305-316.

[79] https://pubs.usgs.gov/circ/circ1182/pdf/15WCFlorida.pdf

	First Responders Impacts on the public include the possibility of falling or driving into a sinkhole. Members of the public are also at risk of injury or death from structural collapse caused by sinkholes. Continuity of Operations (including continued delivery of services) If a sinkhole affects structures or critical infrastructure, operations may be interrupted. *Property, Facilities, Infrastructure* Land subsidence or sinkholes would affect a very specific location, thereby affecting a limited number of people. In many cases, sinkholes can cause major structural damage while others are only impacted moderately. This may depend not only on the type of sinkhole, but also on the type of construction used. For example, a concrete block structure may show severe cracking of the blocks and mortar holding them together creating a situation where the integrity of the structure is at risk versus a frame structure may have the ability to somewhat flex with the shifting of the ground and have relatively little structural damage. *Environment* Sinkholes are part of the natural environment, but there may be damage to some natural spaces from a sinkhole, for example, a public park may be damaged and result in closure. *Economic Condition* Sinkhole damage repair can be very expensive, so a sinkhole may have a significant negative impact for the property owner. A sinkhole would likely not affect the economy of a community. *Public Confidence in the Jurisdictions Governance* If there is an increase in sinkhole occurrences and the government does not address the issue, the public may become concerned about what would happen if a sinkhole were to affect their property.
Vulnerability	The Florida Department of Environmental Protection has developed a sinkhole favorability map that shows that portions of Hernando County are very geologically favorable to sinkholes. [80]The data shows the geologic favorability for the development of sinkholes and therefore is not useful to determine whether or not people, property or critical facilities are actually vulnerable. Furthermore, a loss estimation was not conducted because it would not have been useful for risk assessment purposes because of the imprecise method of identification of areas favorable for sinkhole development

Figure 3-15 – Subsidence Incidents and Sinkhole Types[81]

[80] Florida Department of Environmental Protection Florida Geological Survey. (2017). *The favorability of Florida's geology to sinkhole formation.* Page 4.

[81] https://floridadep.gov/fgs/sinkholes/content/subsidence-incident-reports

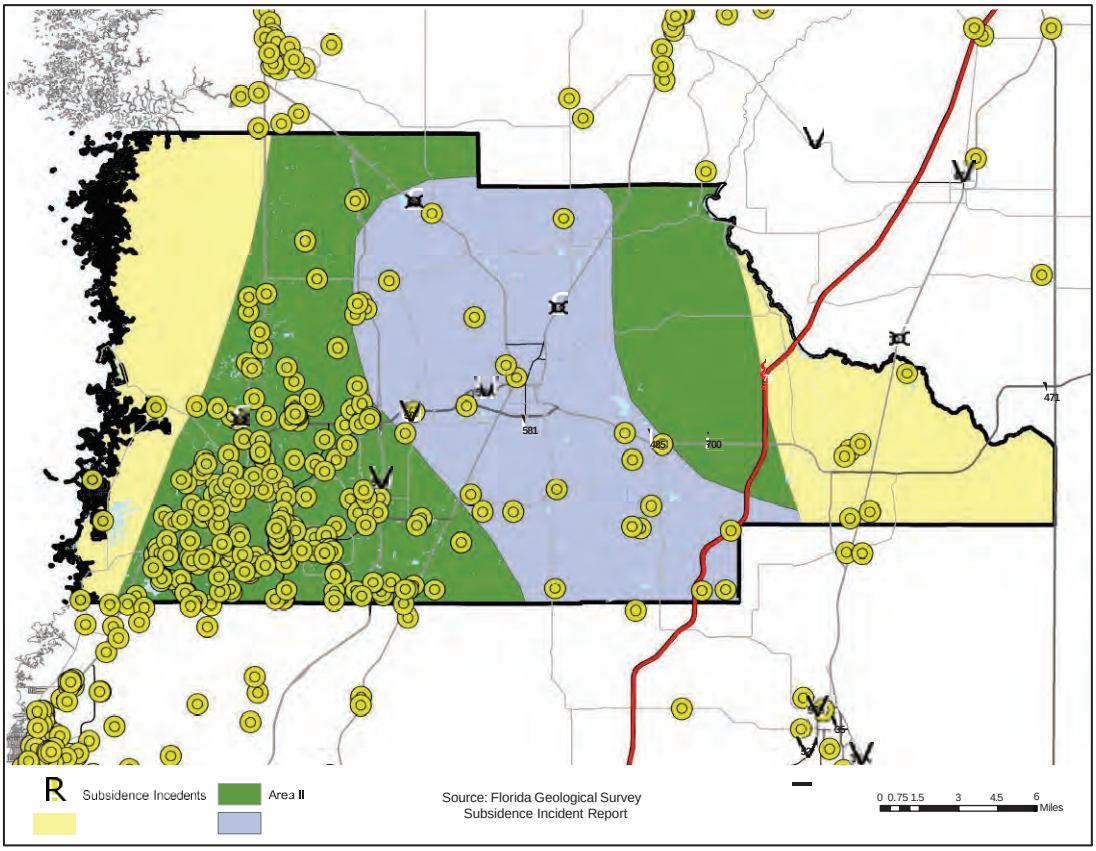

Subsidence Incedents
Area II
Source: Florida Geological Survey
Subsidence Incident Report
0 0.75 1.5 3 4.5 6
Miles

Table 3-36 – Subsidence Incidents 2014 - 2019[82]

Incident Date	Length	Width	Depth	Incident Location	Incident Notes
1/9/2014	50	25	20	Springhill	SWO# 2014-213: existing sinkhole in stormwater collection basin was being remediated and while remediating the sinkhole collapsed further
4/6/2014	10	10	10	Spring Hill	Possible sinkhole in a retention pond. One home is 30 feet away and roadway is about 30 feet away
5/27/2014	null	null	null	Weeki Wachee	SH is located under the house. 60 trucks of concrete were used to fill the SH. Water is visible.
6/1/2014	3	3	3	Spring Hill	Rock and sand visible at the bottom of sinkhole. Tiburon Ave received minor damages.
7/19/2014	105	105	30	Spring Hill	9759 Eldridge Road sustained most of damage. Four houses evacuated.
10/11/2014	null	15	5	Spring Hill	The potential sinkhole is 15 feet wide and 4 to 5 feet deep.
11/11/2014	5	5	3.5	null	Sinkhole is located in driveway and is 5 ft. by 5 ft. and 3-4 feet deep
12/23/2014	null	null	null	Aripeka	Sinkhole forming at the edge of the bridge crossing the Weeki Wachee River in Aripeka, size unknown
5/19/2015	null	null	null	null	null
2/13/2016	12	11	null	null	null
6/6/2017	4	4	5	null	SWP 2017-4151
1/29/2018	4	4	3	SPRING HILL	Hernando County SO reports a sinkhole that is 3 ft deep with a 4 ft diameter in Spring Hill.
5/17/2018	5	5	null	BROOKSVILLE	Caller stated the subsidence opened in a retention pond resulting in it draining entirely into the hole.

Hazard Ranking

The LMS Planning Committee determined geological events to be a moderate priority hazard in Hernando County. As described in the profile above, the annual probability of a geological event is Highly Likely, however the impacts are Limited as most sinkholes recorded in Hernando County are small. Table 3-37 outlines the hazard rankings for each of the hazard priority criteria related to geological events (sinkholes).

[82] https://floridadep.gov/fgs/sinkholes/content/subsidence-incident-reports

Table 3-37 – Vulnerability Scorecard

Frequency	Ranking of how often hazard occurred in the past. 3 - Very Likely: annually
Probability	Ranking of the likelihood of the hazard occurring in the future. 3 - Very Likely: annually
Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 1 - Low: no injuries or deaths recorded Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to the hazard occurrence. 1 - Low: little to no impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 2 - Medium: minor damage to environment recorded
Total Points	**10**

3.11 Winter Storm and Freeze

Hazard Profile Section	**Winter Storm and Freeze**
Description	Severe winter weather includes extreme cold, snowfall, ice storms, winter storms, and/or strong winds, and affects every state in the continental United States. Areas where such weather is uncommon, such as Florida, may experience a greater impact on transportation, agriculture, and people from relatively small events compared to other states that experience winter weather more frequently. While winter storms have not been recorded in Hernando County, freezing events are more common. Freeze occurs when overnight temperatures reach at least 32 degrees Fahrenheit. A Hard Freeze occurs when the temperature falls below 28 degrees Fahrenheit for four hours or more. While most vegetation can survive frost, very little vegetation can survive a hard freeze and this is when the most damage to crops occurs. Prolonged exposure to freezing temperatures can cause frostbite or hypothermia and become life threatening. Infants and elderly people are most at risk. In areas, unaccustomed to winter weather, near freezing temperatures are considered extreme cold. During unexpected cold periods there are often issues with propane gas supplies, and electrical and natural gas systems are pushed to their limits to meet the record demands. Also, residents in Hernando County may have inadequate heating systems and insulation and turn to alternatives such as space heaters and wood fires that increase the likelihood of accidental house fires.
Location	Freezing events are equally likely to occur anywhere within the County, including the City of Brooksville. A freeze could occur in residential neighborhood and business districts within Hernando County and the City of Brooksville. It could also occur in agricultural areas where there is livestock and crops. Based on historic occurrences winter storms are not likely to occur in Hernando County.
Extent	Although somewhat rare, winter storms and freezes can immobilize an entire region. Even areas that normally experience mild winters can be greatly affected. All parts of Hernando County are considered to be equally likely to be impacted by extreme cold

	and freeze events. Previously recorded incidents of extreme cold or freeze resulted in up to $1M in crop losses. Table 3-38 lists the fruit temperatures at which freezing begins.
Previous Occurrences	In December of 1894 the temperature fell to the teens and frost and ice-covered plants and trees for three days. A second freeze hit growers six weeks later. During the winter of 1926-27 many trees were killed by frost. The next winter was a repeat, and all citrus trees were destroyed. Another freeze in 1934 wiped out more than 2,000 acres of citrus and caused many growers to go into the poultry business. A 1962 hard freeze with a low temperature of 8 degrees all but put the citrus industry out of business. Income fell from $3.522 million to $229,000. Two freezes in 1983 and another in 1985 brought economic havoc on Hernando County. In 1983 eight thousand acres were lost and the tax rolls lost over $7 million. The 1985 freeze caused 6,471 acres to be lost and the remainder severely damaged. In the years 2000 to 2003 eleven freezes occurred each year and from 2004 through 2008 a total of seventeen incidents of freezing weather occurred. In 2010, several significant freeze events occurred. On January 5th, the Governor issued Executive Order 10-01 declaring a state of emergency to protect Florida's agricultural crops and general welfare. The Order was extended by the Governor (in Executive Order 10-07) for another 7 days from January 19th through January 25th in order to continue efforts to transport undamaged crops. On January 29th, after reviewing agricultural loss assessments, the USDA designated 60 of Florida's 67 counties (including Hernando) as natural disaster areas. With an already cold air mass in place, a cold front moved through the area on January 8th. An upper disturbance then passed over the area on January 9th, causing some areas from Tampa north to experience sleet and snow flurries mixed with the light rain. Very cold and very dry Arctic high pressure then built into the area causing temperatures to plummet into the teens and twenties across the area each morning from January 10th through January 12th, and remain below freezing for numerous hours each night. Numerous minimum temperature records were broken at several recording stations across the area each night. The extent of the cold combined with the multiple day duration caused significant damage to crops across the area. Marine life also suffered greatly, with the aquaculture industry devastated and wildlife enduring numerous fish kills and rescue efforts for manatees and sea turtles due to the Gulf of Mexico water temperatures dropping into the upper 40s. Nearly 200 of the roughly 5,000 manatee population perished from the cold. There were 47 sea turtles rescued from local beaches, 10 of which perished from the cold. Saltwater snook, bonefish, and tarpon endured widespread fish kills, and freshwater tilapia also suffered widespread kills, with some lakes reporting up to 95 percent of the population killed. A cold front moved through the area on February 24th, with cold Canadian high pressure settling over the area behind the front. The night of the 25th into the morning of the 26th was the coldest, with several counties across the northern half of the area experiencing 8 hour or longer sub-freezing durations. With the extreme freezes and losses that occurred in January, this freeze at the end of February caused additional losses to already weakened and newly planted crops. Florida experienced the coldest December on record in 2010 as numerous arctic cold fronts moved across the state. There were three large freeze events where cold Canadian high pressure built into the area behind a strong cold front. The first of these occurred on December 7th-8th, with the Nature Coast experiencing 9 to 11 hours of sub-freezing temperatures and up to 8 hours of temperatures below 27 degrees. The most damaging of these systems occurred on December 14th-15th, with much of the area experiencing hard freeze conditions for 7 to 12 hours across the Nature Coast and 3 to 5 hours elsewhere. Sub-freezing conditions were recorded for more than 12 hours as far south as Sarasota County. The final freeze event occurred over a two-night period on December 27th-28th,

<table>
<tr><td></td><td>and December 28th-29th. Both nights saw sub- freezing temperatures for 10 to 14 hours across the northern half of the area and 4 to 8 hours across the southern half. In addition, hard freeze conditions were in place across the Nature Coast for up to 11 hours.
A strong cold front moved southeast through the Florida Peninsula on the January 17th of 2018, with strong cold air advection causing a hard freeze over large portions of the Nature Coast and west central Florida during the morning of the 18th. Another hard freeze occurred on the morning of the 19th as light winds and clear skies allowed for strong radiational cooling. The freeze caused unknown amounts of damage to citrus crops in Hernando, Pasco, Hillsborough, Polk, Manatee, Sarasota, Hardee, DeSoto, and Highlands Counties. There was also an unknown amount of damage to strawberry and crops in Hillsborough, Polk, Manatee, Sarasota, and Hardee County. In addition, the freeze also damaged landscaping across west central and southwest Florida. Temperatures dropped into the low to mid 20s across inland portions of Hernando County for several hours on the morning of the 18th, causing damage to citrus crops and landscaping. The coldest temperature reported was 24 degrees at the ASOS site in Brooksville (KBKV).
Hernando County has experienced frost/freeze multiple times annually; however, not all events cause extensive damage.
There have been six FEMA declared severe winter weather events in Florida since 1970. These events all related to freezing and to a large degree focused on the overall impact to the Florida economy.
March 15, 1971
March 29, 1984
March 18, 1985
January 15, 1990
March 13, 1993
February 6, 2001
The last winter weather FEMA declaration which included Hernando County was on February 6, 2001. FEMA Declaration Number 1359 provided unemployment compensation or Disaster Unemployment Assistance benefits to individuals who lost jobs or businesses in designated counties as a direct result of freezing weather that struck much of the State over the period of December 1 through January 25, 2001.
Temperatures from 2020 to 2024 are displayed in the table below with a minimum temperature over the last five years being 24 degrees.
<table>
<tr><td>24 degrees</td><td>2020</td></tr>
<tr><td>25 degrees</td><td>2021</td></tr>
<tr><td>26 degrees</td><td>2022</td></tr>
<tr><td>24 degrees</td><td>2023</td></tr>
<tr><td>27 degrees</td><td>2024</td></tr>
<tr><td>24 degrees</td><td>MIN</td></tr>
</table>
</td></tr>
<tr><td>Probability</td><td>Because of the moderate frequency of days with temperatures under 32 degrees recorded in Hernando county in the past, it is reasonable to assume that the county will experiences winter storms or freezing events again in the future. The Brooksville Chin Hill Weather station recorded an average of 5.29 days with temperatures at or below 32 degrees per year. The probability of a winter storm or freezing event affecting Hernando County or the City of Brooksville is Likely, with an annual probability between 10 and 100%.</td></tr>
<tr><td>Climate Change</td><td>Climate change is not expected to increase occurrences or magnitude of winter storms and freezes in Hernando County. However, climate change does not mean that winter storms and freezes would not continue to occur in the county. Climate variability will continue to influence daily temperature variability so isolated and prolonged winter storms and</td></tr>
</table>

	freeze events are not unlikely.[83] Severe winter storms will not disappear. Specifically, isolated or prolonged winter freeze events will still occur.
Impacts	*Public* In Hernando County, Brooksville and Weeki Wachee injury or death, as well as possible property damage from car accidents because of ice on roads and bridges may occur. There is also a risk of injury or death from exposure to cold weather, either because of being stranded outside, or inside without proper heating systems. Deaths and injuries have resulted from accidents including automobile collisions due to poor driving conditions. On cold days the electric heaters are turned up throughout the electrical system which can cause an equipment overload. *First Responders* First responders are increasingly at risk as they respond to traffic incidents and calls for medical attention if there is ice on the roads. Continuity of Operations (including continued delivery of services) ▪ Power outages caused by overloaded power grids may impact the ability of businesses to operate and impact the delivery of public services. *Property, Facilities, Infrastructure* Freezing temperatures may result in loss or damage of crops and agricultural revenue. Roads and highways are most vulnerable to the effects of winter storms. Roads frequently become iced over, resulting in accidents, injuries, deaths, and traffic congestion. Roads can be heavily damaged due to winter weather events. Potholes and cracks can be found on roadways after a winter weather event, resulting in the need for repairs, causing further economic losses to the local area. Electrical transmission lines are highly vulnerable to severe winter weather. Other impacts resulting from winter storms include damage to plumbing sewers, and waterlines, as well as minor roof damage and house fires resulting from portable heaters. *Environment* Loss or damage to environment, including green spaces, habitats, species because of cold weather, winter weather, and/or frost/freeze events. *Economic Condition:* Loss or damage to crops because of freezes. *Public Confidence in the Jurisdictions Governance* Power outages may cause the public to believe that the government did not adequately prepare for the incident.
Vulnerability	The LMS Planning Committee determined winter storms and freezing events to be a low priority hazard in Hernando County. As described in the profile above, the annual probability of a winter storm event is Likely, however the impacts are Minor as no injuries, deaths, or building damages have been recorded related to winter storms or freezes. Property damage recorded in relation to this hazard is limited to crop loss. Agricultural areas may be more vulnerable to winter weather and freezing temperatures. According to the 2040 Hernando County Comprehensive Plan, there are 79,199 acres of agricultural land accounting for 24.4% of the overall land in the county. Historic occurrences of freezing events have resulted in crop losses, job losses, and lost revenue

[83] https://nca2018.globalchange.gov/chapter/19/

3.11.1 Extent

Table 3-38 lists the fruit temperatures at which freezing begins.

Table 3-38 - Fruit temperatures at which freezing begins[84]

	Temperature (°F)
Green oranges	28.5 to 29.5
Half-rip oranges, grapefruit and mandarins	28.0 to 29.0
Ripe oranges, grapefruit and mandarins	27.0to 28.0
Button lemons (up to 1/2-inch diameter)	29.5 to 30.5
Tree-ripe lemons	29.5 to 30.5
Green lemons (larger than ½-inch diameter)	28.5 to 29.5
Buds and blossoms	27.0

Figure 3-16 - Days with Temperature <=32 degrees F Yearly [85]

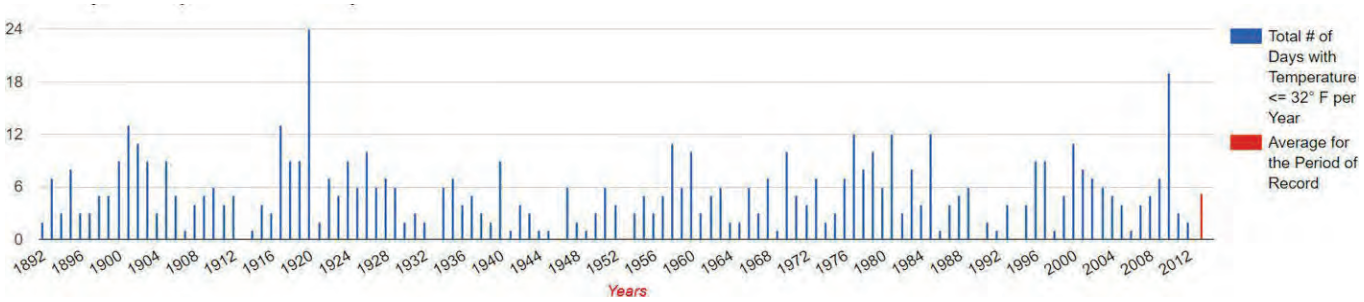


Table 3-39 outlines the hazard rankings for each of the hazard priority criteria related to winter storms and freezing events.

Table 3-39 – Vulnerability Scorecard

Frequency	Ranking of how often hazard occurred in the past. 2 - Likely: every 5-10 years
Probability	Ranking of the likelihood of the hazard occurring in the future. 2 - Likely: every 5-10 years
Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 1 - Low: no injuries or deaths recorded Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to the hazard occurrence. 2 - Medium: minor impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 1 - Low: little to no damage to environment recorded

[84] https://citrusresearch.org/wp-content/uploads/frost_issue.pdf

[85] https://climatecenter.fsu.edu/climate-data-access-tools/climate-data-visualization

Total Points	**8**

3.12 Seismic

A seismic event, or an earthquake, is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface that creates seismic waves. This shaking can cause buildings and bridges to collapse; disrupt gas, electric, and phone service; and sometimes trigger landslides, and tsunamis or indirectly cause flash floods or fires.

Although seismic events have been known to affect other portions of the state, no events have been recorded in Hernando County. According to the USGS, the expected frequency of damaging earthquake shaking is fewer than 2 occurrences over a period of 10,000 years.[86] Because of the low probability of seismic events, extent, location, and summary of impacts were not assessed for this hazard.

Impacts to the City of Brooksville would likely be little to none, given the low probability of occurrence in that jurisdiction. In the small chance of a seismic event in Hernando County, there are threats to public infrastructure and loss of access by first responders on the coast, loss of land and related impacts to vulnerable ecosystems in the immediate vicinity, and potential impacts to tourism economic sectors including small businesses. Impacts to governance are unlikely.

Hazard Ranking

The LMS Planning determined seismic events to be a low priority hazard in Hernando County. As described in the profile above, the annual probability of a seismic event is Unlikely.

Table 3-40 – Vulnerability Scorecard

Frequency	Ranking of how often hazard occurred in the past. 1 - Not Likely: every 50-100 years
Probability	Ranking of the likelihood of the hazard occurring in the future. 1 - Not Likely: every 50-100 years
Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 1 - Low: no injuries or deaths recorded Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to hazard occurrence. 1 - Low: little to no impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 1 - Low: little to no damage to environment recorded
Total Points	**5**

Due to the low probability of occurrence, a vulnerability assessment will not be conducted for this hazard. Should the probability of seismic events in Hernando County change in the future, the LMS Working Group will incorporate a full assessment of the hazard either at the required 5-year cycle review or post disaster.

3.13 Tsunami

Tsunamis are powerful waves created because of another non-meteorological, geologic in nature, hazard such as earthquakes, underwater landslides, volcanic eruptions, or other displacements of large amounts of water under the sea. As the waves travel towards land, they build up to higher heights as the depth of the ocean decreases and appear as walls of water or turbulent waves that resemble hurricane storm surge. The

[86] https://www.usgs.gov/programs/earthquake-hazards/science/introduction-national-seismic-hazard-maps

speed at which a tsunami travels depends on the ocean depth rather than the distance from the source of the wave. Deeper water generates greater speed, and the waves slow down when reaching shallow waters. Where the ocean is deep, tsunamis can travel at speeds up to 500 miles an hour. Tsunamis arrive on land with enormous force and recede with nearly equal force.[87]

Although tsunamis have been known to affect the Atlantic Coast of Florida, no events have been recorded on the Florida Gulf Coast. Since earthquakes cause most tsunamis and Florida is in a seismically stable region, there is a low probability that a tsunami will affect Florida. However, underwater landslides can also trigger tsunamis. Such landslides are unlikely, but not impossible, with most likely impacts occurring to the coastal area of the County.[88] Because of the low probability of tsunami, extent, location, and summary of impacts were not assessed for this hazard.

Impacts to the City of Brooksville would likely be little to none, given the low probability of occurrence in that jurisdiction. In the small chance of a tsunami affecting Hernando County, there are threats to public infrastructure and loss of access by first responders on the coast, loss of land and related impacts to vulnerable ecosystems in the immediate vicinity, and potential impacts to tourism and economic sectors including small businesses. Impacts to governance are unlikely.

Hazard Ranking

The LMS Planning Committee determined tsunamis to be a low priority hazard in Hernando County. As described in the profile above, the annual probability of a tsunami is Unlikely.

Table 3-41 – Vulnerability Scorecard

Frequency	Ranking of how often hazard occurred in the past. 1 - Not Likely: every 50-100 years
Probability	Ranking of the likelihood of the hazard occurring in the future. 1 - Not Likely: every 50-100 years
Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 1 - Low: no injuries or deaths recorded Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to the hazard occurrence. 1 - Low: little to no impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 1 - Low: little to no damage to environment recorded
Total Points	**5**

Due to the low probability of occurrence a vulnerability assessment will not be conducted for this hazard. Should the probability of tsunami events in Hernando County change in the future, the LMS Working Group will incorporate a full assessment of the hazard either at the required 5-year cycle review or post disaster.

Technological and Human Caused Hazards

[87] Enhanced State Hazard Mitigation Plan, State of Florida, 2018
[88] http://dep.state.fl.us/geology/geologictopics/hazards/tsunamis.htm

3.14 Hazardous Materials

3.14.1 Description

A hazardous material is any substance that poses a threat to humans, animals, or the environment. Hazardous Materials, commonly referred to as HazMat, refers generally to hazardous substances, petroleum, natural gas, synthetic gas, and acutely toxic chemicals. Hazardous materials are defined and regulated in the United States primarily by laws and regulations administered by the EPA, OSHA, DOT, and the Nuclear Regulatory Commission (NRC).

The Occupational Safety and Health Administration (OSHA) further explains that HazMat is any substance or chemical which is a health hazard or physical hazard, including:

- chemicals which are carcinogens, toxic agents, irritants, corrosives, sensitizers;
- agents which act on the hematopoietic system;
- agents which damage the lungs, skin, eyes, or mucus membranes;
- chemicals which are combustible, explosive, flammable, oxidizers, pyrophorics, unstable-reactive or water-reactive; and
- chemicals which in the course of normal handling, use, or storage may produce or release dusts, gases, fumes, vapors, mists, or smoke which may have any of the previously mentioned characteristics.

Hazardous materials typically fall into one of three categories: Biological Hazards, Chemical Hazards, or Radiological Hazards. All of these HazMats have both short-term and long-term effects based on the timing of detection and the response time to mitigate the effects of the hazard.[89]

The Emergency Planning and Community Right-To-Know Act (EPCRA), Section 302, requires facilities to notify the state/tribe emergency response commissions (SERCs/TERCs), and local emergency planning committees (LEPCs) of the presence of any "extremely hazardous substance" (the list of such substances is in 40 CFR Part 355, Appendices A and B) if it has such a substance in excess of the substance's threshold planning quantity, and directs the facility to appoint an emergency response coordinator.

3.14.2 Location

Hazardous material incidents can occur during the production, transportation, use, and storage of those hazardous materials and can happen anywhere within Hernando County. As these materials are processed and stored, those in the immediate vicinity are at risk of toxic fumes, soil contamination, and water contamination. Even parts of the county that do not have production or storage facilities are at risk given that hazardous materials are routinely and frequently transported via roadways, railways, pipelines, and waterways, concluding that all areas of the state are potentially at risk.

3.14.3 Extent

Hazardous materials releases are usually isolated to a particular site. The people impacted from a hazardous material release could be limited to the specific area surrounding the release or could expand to a larger area, within 1 mile of the site depending on the chemical, location, and the necessary response to clean and remediate the site.

3.14.4 Previous Occurrences

Major hazardous material releases have not been recorded in Hernando County, but are likely based on the existing transportation infrastructure, the presence of hazardous material facilities. Table 3-42 lists previous occurrences of hazardous material incidences in Florida which are reflective of the risk that exist in

[89] https://www.osha.gov/chemical-hazards

Hernando County.

Table 3-42 – Hazardous Materials, Previous Occurrences[90]

Date	Description
December 15, 2009	Approximately 1,000 gallons of sodium hydroxide was released from a faulty gasket on a pipeline connected to an above ground storage tank at the liquid transfer facility in St. Marks, Florida. The product flowed to an adjacent tidal creek before ultimately releasing some of the product into the St. Marks River. A Unified Command was established between EPA, USCG, DEP, County EMA, DOI and the RP. Response efforts included stabilizing the leaking gasket, sampling the impacted water bodies, conducting water patrols to ensure endangered/threatened species did not enter the area (e.g., manatees, birds, and alligators), damming up the tidal creek and pumping out the majority of the contaminated water (ph12+) from the tidal creek. The contaminated water was transferred to a containment area and was properly treated and disposed of.
May 9, 2009	An east coast railway train consisting of 22 rail cars and 2 locomotives derailed in Palm Coast, Florida. One rail car containing hydrochloric acid (HCL) was breached, resulting in HCL being released into the environment. Response operations concentrated on providing air-monitoring support for worker safety, as well as ensuring the off-loading procedures were conducted in a safe manner.
May 31, 2011	The DEP's Bureau of Emergency Response reported a mercury spill in a residential house in Tampa, Florida. DEP personnel observed at least two ounces of visible mercury within the residence. Mercury vapor readings with windows open in two rooms were 43,000 ng/m3 and 47,000 ng/m3 respectively (Lumex readings). Based on the readings, DEP advised the owners and their children to relocate until the hazards could be mitigated. The source of mercury is unknown and was discovered during home renovation activities.

[90] Enhanced State Hazard Mitigation Plan, State of Florida, 2018

January 11, 2012	Exposure to an unknown substance on a forest service road overcame two nearby community members. The Lake County HazMat Team conducted field screening of material and identified formaldehyde as a constituent.
July 22, 2012	Kinder Morgan (Central Florida Pipeline) had an ongoing release of refined petroleum product from a 10 inch pipeline. Kinder Morgan shut off the pipeline and responded with state and local response agencies to locate the source and evaluate extent of impact. It was determined that the pipeline failed in a drainage ditch full of water. The ditch flows into a nearby creek which discharges into Tampa Bypass Canal and then into McKay Bay. Kinder Morgan estimated 750 barrels of refined product were released. About two miles of the creek, which includes ditches, creek, ponds, and wetlands were impacted.
January 28, 2014	A train derailment in McDavid, Florida resulted in railcars containing phosphoric acid submerging in Fletcher Creek. There were no reported injuries or fatalities. A total of four railcars with 96% concentration phosphoric acid were derailed, at least one was leaking into the creek. Each railcar contained 12,000 gallons.
September 23, 2016	A tanker truck containing 8,000 gallons of petroleum products overturned on Interstate 75 in North Port, Florida. Both shoulders of the interstate were affected as well as nearby wetlands. FDEP, Sarasota County HazMat, and Charlotte County Fire Rescue responded.
April 3, 2017	A collision between two trains resulted in the release of approximately 7,400 gallons of diesel fuel and 77 gallons of battery acid.
June 3, 2019	Hillsborough County firefighters and members of the Hazardous Incident Team responded to a chemical spill near the Florida State Fairgrounds after a forklift punctured a 55-gallon drum of hydrofluoric acid.[91]
June 6, 2019	A building on the campus of the University of South Florida was evacuated as a hazardous materials incident after eight people complained of dizziness. One of the eight people was transported to the hospital for treatment, the others were treated at the scene. Air quality tests returned no abnormal results.[92]

[91] http://www.fox13news.com/news/local-news/chemical-spill-prompts-warning-to-fairgrounds-area
[92] https://www.abcactionnews.com/news/region-hillsborough/usf-building-evacuated-as-hazmat-incident

3.14.5 Probability

Taking into consideration the large volume of truck traffic and four (4) major highways, SR 50, going east to west and US 301, US 98, US 19, US 41, and I-75 going north to south the probability of a hazardous transportation incident is high. However, the probability of an Extremely Hazardous Substance (EHS) from a 302 Facility is Low. In Hernando County the most frequent incidents are traffic accidents along these major routes. In addition, the railroad transports unknown amounts of hazardous material, so we face the probability of a train derailment or a car to rail incident. This makes the chances of a spill or release much higher. Chlorine is one of the most abundant and extremely hazardous substances stored in Hernando County. With the transport of so many hazardous materials on our highways it increases our likelihood of an accidental spill of a hazardous material during transport.

Major chemicals spills can occur at any facility that produces, uses, or stores chemicals. These include chemical manifesting plants, laboratories, shipyards, railroad yards, warehouses, or chemical disposal areas. Illegal dumpsites can appear anywhere. Accidents involving the transportation of hazardous materials can occur at any time and severely impact the affected community. Recent evidence shows that hazardous materials incidents may be the most significant threat facing local jurisdictions.

The probability of a hazardous materials event is Possible with an annual probability between 1 and 10%.

3.14.6 Summary of Impacts

The impact of a hazardous material event, based on previous events is Minor, with very few injuries, if any. Only minor property damage and minimal disruption of quality life is seen in prior occurrences. Temporary shutdown of critical facilities is possible.

Public

The public may be affected during a hazardous materials incident which my result in loss of life or injury from contamination. Additionally, diseases may be exacerbated as a result of a hazardous materials incident. Additionally, the public could be impacted by an increased risk to the aquifer water supply. A hazardous materials spill in the vicinity of a major sinkhole during a storm event could endanger drinking water supply.[93]

First Responders

First responders may be affected during a hazardous materials incident which may result in loss of life or injury from contamination, explosions, cleanup and destruction. Hazardous material incidents may also expose first responders to diseases.

Continuity of Operations

Continuity of Operations may be impacted during a hazardous materials event due to lost material. For example, a hazardous materials incident involving gas could lead to shortages and price increases.

Property, Facilities, Infrastructure

Properties, facilities and infrastructure may be damaged due to excavation and removal of soil and water. Properties may be impacted because of an inability to rebuild in affected areas.

Transportation services could be closed or blocked due to the contaminant affecting roads, train tracks, airplane flight paths, bridges, and waterways.

Properties that are part of a hazardous waste site could be impacted if there is long term contamination.

[93] https://pubs.usgs.gov/circ/circ1182/pdf/15WCFlorida.pdf

Environment

The environment may be affected during a hazardous materials incident which may result in death or illness to pets or wildlife near the spill. There may also be damage to plants and wildlife during a hazardous materials incident. The environment may be impacted by airborne issues such as toxic fumes, gases or vapors caused by chemicals. Environmental impacts may also include water contamination, soil contamination, loss of critical or endangered species and/or pollution.

Economic Condition

The economic condition of a community could be impacted during a hazardous materials event, by business closures leading to lost revenue and wages, loss of tourism and income, loss of product, and the cost of cleanup and restoration.

Public Confidence in Jurisdiction's Governance

If the government doesn't communicate with the public, fear could ensue, leading to a fear of the government. If cleanup is slow, the public could believe the government doesn't know how to properly clean it up or that the accident was malicious.

Hazard Ranking

The LMS Planning Committee determined hazardous materials incidents to be a medium priority hazard in Hernando County. As described in the profile above, the annual probability of a hazardous materials is Possible. Typical hazardous materials incidences have limited impacts with minor injuries and the possibility of property damage. Warning times for hazardous materials events would typically be less than 6 hours, and the duration of an event would likely be less than one week.

Table 3-43 – Vulnerability Scorecard

Frequency	Ranking of how often hazard occurred in the past. 2 - Likely: every 5-10 years
Probability	Ranking of the likelihood of the hazard occurring in the future. 2 - Likely: every 5-10 years
Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 1 - Low: no injuries or deaths recorded Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to the hazard occurrence. 1 - Low: little to no impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 1 - Low: little to no damage to environment recorded
Total Points	***7***

3.14.7 Vulnerability Analysis

Major HazMat incidents can occur at any facility that produces, uses, or stores hazardous materials. These include chemical manifesting plants, laboratories, shipyards, railroad yards, warehouses, or chemical disposal areas. Illegal dumpsites can appear anywhere. Accidents involving the transportation of hazardous materials can occur at any time and severely impact the affected community. The entire county is vulnerable to HazMat Incidents.

A hazardous material release event that takes place at a fixed site can have a wide impact on people, buildings and critical facilities nearby. The level of impact from this release can vary greatly depending on the type of waste, the amount of contact an individual has with the chemical, and if there is an explosion or fire associated with the event.

A hazardous material release event can be particularly costly to clean up, especially when groundwater and soil have been contaminated. Contamination can travel outward from a spill and leave localities and even regions uninhabitable, especially when water and food stocks are impacted. These affected areas also become less attractive to tourists and the economy. Several facilities in Hernando County store, use, dispose, or have the capacity and infrastructure to handle hazardous materials on a regular basis. Hazardous materials are widely used at facilities such as hospitals, wastewater treatment plants, and farms.

3.15 Cyber Incident

3.15.1 Description

According to the Department of Homeland Security, a cyber incident is any attempted or successful access to, exfiltration of, manipulation of, or impairment to the integrity, confidentiality, security, or availability of data, an application, or an information system, without lawful authority.[94] Cyber incidents involve computers, networks, and information or services that affect daily operations and critical infrastructure.

A Cyber Incident differs from traditional hazards such as a flood, which makes it difficult to plan for, respond to, recover from, and mitigate against. For example, there is often a lack of physical presence or evidence of a cyber-incident, making it difficult to understand the scope of the incident. Furthermore, the scope will likely cross municipal jurisdictions because of the nature of cyber technology. There are also fewer resources for cyber incidents due to a lack of awareness and knowledge of the cyber threat.[95]

The duration of a cyberattack is dependent on the complexity of the attack, how widespread it is, how quickly the attack is detected, and the resources available to aid in restoring the system. One of the difficulties of malicious cyber activity is that it could come from virtually anyone, virtually anywhere. Table 3-44 summarizes common types of cybersecurity threats.

Table 3-44 - Types of Cyber Attacks[96]

Type of Attack	Description
Denial of Service	A method of attack from a single source that denies system access to legitimate users by overwhelming the target computer with messages and blocking legitimate traffic. It can prevent a system from being able to exchange data with other systems or use the Internet.
Distributed denial of Services	A variant of the denial-of-service attack that uses a coordinated attack from a distributed system of computers rather than from a single source. It often makes use of worms to spread to multiple computers that can then attack the target.
Exploit tools	Publicly available and sophisticated tools that intruders of various skill levels can use to determine vulnerabilities and gain entry into targeted systems.

[94] https://fas.org/irp/offdocs/nspd/nspd-54.pdf
[95] FEMA. (2016). *Community Preparedness for Cyber Incidents MGT 384* (Version 1.1). Page 2.7 – 2.8
[96] https://www.gao.gov/new.items/d05434.pdf

Logic bombs	A form of sabotage in which a programmer inserts code that causes the program to perform a destructive action when some triggering event occurs, such as terminating the programmer's employment.
Phishing	The creation and use of e-mails and Web sites—designed to look like those of well-known legitimate businesses, financial institutions, and government agencies—in order to deceive Internet users into disclosing their personal data, such as bank and financial account information and passwords. The phishers then take that information and use it for criminal purposes, such as identity theft and fraud.
Sniffer	Synonymous with packet sniffer. A program that intercepts routed data and examines each packet in search of specified information, such as passwords transmitted in clear text.
Trojan horse	A computer program that conceals harmful code. A Trojan horse usually masquerades as a useful program that a user would wish to execute.
Virus	A program that infects computer files, usually executable programs, by inserting a copy of itself into the file. These copies are usually executed when the infected file is loaded into memory, allowing the virus to infect other files. Unlike the computer worm, a virus requires human involvement (usually unwitting) to propagate.
War dialing	Simple programs that dial consecutive telephone numbers looking for modems.
War Driving	A method of gaining entry into wireless computer networks using a laptop, antennas, and a wireless network adaptor that involves patrolling locations to gain unauthorized access.
Worm	An independent computer program that reproduces by copying itself from one system to another across a network. Unlike computer viruses, worms do not require human involvement to propagate.

3.15.2 Location & Extent

Because cyber incidents occur in "cyber space," there are not always geographic areas affected by cyber incidents. However, cyber incidents may cause physical disruptions in critical infrastructure, which could affect a jurisdiction or a power grid. It is important to note that power grids are vast, sometimes crossing state lines, meaning that a cyber incident at one facility at one location could cause disruptions at other locations hundreds of miles away.

3.15.3 Previous Occurrences

To date there have been no prior occurrences of cyber incidents in Hernando County, however public agencies in Florida have been targeted by cyber attacks.

Undated and Widespread:

- A virus called "Sobig" infected the computer system at CSX Corp's Jacksonville, Florida headquarters. It shut down signaling, dispatching, and other systems and affected 23 states east of the Mississippi River.[97]
- A disgruntled employee of a contractor that supplied IT and control system technology for the sewage system in Maroochy Shire Queensland, Australia used his insider knowledge of the sewage system to issue commands. This led to 800,000 liters of raw sewage spilling into local parks, rivers, and the grounds of a hotel. The effects included marine life dying, water turning black, and a stench

[97] FEMA. (2016). *Community Preparedness for Cyber Incidents MGT 384* (Version 1.1). Page 2.32 – 2.33

that was unbearable for the residents.[98]

- Melbourne, Australia's Metropolitan ambulance service conducted an upgrade that disabled the service's computer-aided dispatch system for 24 hours. This caused delayed response and duplicate responses.[99]
- The WannaCry ransomware infected computers in 99 countries. This malware encrypted files and demanded $300 in Bitcoins to unlock the files. Computers affected included banks, healthcare facilities, shipping companies, utility companies, etc.[100]

Table 3-45 - Cyber Incident Previous Occurrences

Date	Location	Description
2011	Orlando, Florida	City of Orlando was targeted by the hacktivist group Anonymous because non-profit workers were arrested for distributing food without permits (FEMA MGT, 384, 1-30)
2015	Panama City, Florida	An anonymous source leaked 11.5 million documents from a law firm in Panama City. The documents detailed financial and attorney-client information for more than 200,000 offshore entities. When reporters searched through the information, it was discovered that the law firm had been involved in illegal actions, including fraud and tax evasion.[101]
2016	Sarasota, Florida	A ransomware virus on the Sarasota City Hall computer systems encrypted 160,000 files and demanded $33 million in Bitcoins to unlock them. The IT staff quickly shut down the system, which saved the city from catastrophic data loss and financial costs, and the attack was contained within a few hours.[102]
2017	Florida	A cyber-attack on a server used to administer Florida Standard Assessments prevented students from testing. It also made clear that the student and employee information may not be safe. [103]
2018	Collier County, Florida	Collier County became a victim of a phishing scheme that netted foreign attackers $184,000 in taxpayer money, according to investigators. County funds in December 2018 were the target of what the Federal Bureau of Investigation identifies as a "Business Email Compromise," county and clerk of court's office officials said.[104]

[98] FEMA. (2016). *Community Preparedness for Cyber Incidents MGT 384* (Version 1.1). Page 2.41 – 2.42

[99] FEMA. (2016). *Community Preparedness for Cyber Incidents MGT 384* (Version 1.1). Page 2.42 – 2.43

[100] http://www.bbc.com/news/technology-39901382

[101] Bloomberg, J. (2016, April 21). Cybersecurity Lessons Learned From 'Panama Papers' Breach. Retrieved from Forbes website: https://www.forbes.com/sites/jasonbloomberg/2016/04/21/cybersecurity-lessons-learned-from- panama-papers-breach/#3a353ae2003f

[102] Murdock, Z. (2017, July 28). The City of Sarasota, A Ransomware Attack, ISIS and the FBI. Herald-Tribune. Retrieved from http://www.heraldtribune.com/news/20170728/city-of-sarasota-ransomware-attack-isis-and-fbi

[103] http://www.fldoe.org/newsroom/latest-news/2010319-fdle-investigating-cyber-attacks-against-fsa-testing- system-.stml

[104] https://www.naplesnews.com/story/news/crime/2019/08/20/7-florida-municipalities-have-fallen-prey-cyber- attacks-ryuk-ransomware-phishing/2065063001/

2019	Riviera Beach, Florida	An email infected with ransomware shut down the city's network. Email, phones, police records, and city department websites were inaccessible and inoperable. The city council authorized the city insure to pay 65 bitcoins, valued at roughly $600,000 in the hopes of regaining data made inaccessible by the attack.[105]
2019	Florida; United States	Hackers exploited vulnerability in Superion's Click2Gov Utility Bill Pay Systems affecting government entities across the U.S. Over 20,000 records from eight cities in five different states have been offered for sale on the dark web.
2019	Naples, Florida	The City lost $700,000 in a spear phishing cyber-attack. Money was transferred to a fake bank account provided by the attacker who was posing as a representative from a construction firm that had been hired to do infrastructure work in the city's downtown.[106]

3.14.1 Probability

Based on the number of prior occurrences targeting local governments, there is a growing probability of future cyber incidents in Hernando County, the City of Brooksville and the City of Weeki Wachee. However, the probability of a single jurisdiction being attacked is difficult to determine. The probability of a cyber incident is Unlikely with less than 1% annual probability.

3.14.2 Summary of Impacts

Public

Members of the public may be impacted by a cyber incident due to the release of sensitive information including bank accounts and social security numbers. The public may also suffer from a loss of wages if their employer is forced to close during a cyber incident.

First Responders

First responders may have to work long hours outside of regular work hours to stop and/or remediate a cyber incident. Additionally, first responders may not be able to respond properly if a cyber-attack targets emergency or public safety systems.

Continuity of Operations (including continued delivery of services)

Cyber incidents could take operations offline for any amount of time and/or make information inaccessible or distribute false information. An incident could interrupt public safety, etc. services or result in a loss of critical systems or data. Cyber incidents may result in a loss of productivity and may disable emergency or public safety systems.

Property, Facilities, Infrastructure

Cyber incidents could lead to damage of equipment related to the operation of infrastructure.

Environment

A cyber incident could cause a release of hazardous material, which could damage the environment.

Economic Condition

Incidents cost millions of dollars to consumers and organizations, in the form of lost wages, lost revenue, and recovery and remediation costs.

Public Confidence in the Jurisdictions Governance

[105] https://www.palmbeachpost.com/news/20190621/in-depth-how-riviera-beach-left-door-wide-open-for-hackers

[106] https://www.naplesnews.com/story/news/crime/2019/08/20/7-florida-municipalities-have-fallen-prey-cyber-attacks-ryuk-ransomware-phishing/2065063001/

Cyber incidents may result in the public losing confidence in the jurisdiction's ability to keep services operational and safe.

Hazard Ranking

The LMS Planning Committee determined cyber incidents to be a medium priority hazard in Hernando County. As described in the profile above, the probability of a cyber incident is Unlikely with an annual probability of less than 1%. The probable hazard impact for cyber incidents is limited, including minor injuries and the possibility of property damage. Cyber Incidents can be costly as indicated in prior incidents. Table 3-46 outlines the hazard rankings for each of the hazard priority criteria related to cyber incidents.

Table 3-46 – Vulnerability Scorecard

Frequency	Ranking of how often hazard occurred in the past. 2 - Likely: every 5-10 years
Probability	Ranking of the likelihood of the hazard occurring in the future. 2 - Likely: every 5-10 years
Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 1 - Low: no injuries or deaths recorded Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to the hazard occurrence. 2 - Medium: minor impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 1 - Low: little to no damage to environment recorded
Total Points	***7***

3.14.3 Vulnerability Analysis

Any agency that utilizes computers and the internet is vulnerable to cyber-incident. The local governments, utilities, hospitals, and schools are heavily reliant on technology for daily operations, including cell phones, handheld devices such as tablets, and computers. Critical facilities may become either uninhabitable or unusable as a result of a cyberattack if their infrastructure if reliant on technology for operations. Critical infrastructure systems are frequently tied to technology, oftentimes through virtual operations and supervisory control and data acquisition (SCADA) systems. Cyber incidents could interrupt the operation of critical infrastructure, as well as traffic control, dispatch, utility, and response systems. Targeted cyberattacks can impact water or wastewater treatment facilities. The disruption of the virtual systems tied to this infrastructure could cause water pollution or contamination and subsequent environmental issues.

Cyberattacks can interfere with emergency response communication and activities. Given that many first responders rely on technology both at operations center and in the field, a cyberattack could impair the ability to communicate. For example, many agencies rely on technology to notify and route responders to the scene of the emergency.

3.16 Terrorism

3.16.1 Description

The population, property, and environmental resources of Hernando County are vulnerable to a threatened or actual terrorist attack. While there are multiple definitions and political connotations that accompany the term terrorism, for the purpose of this document the following definition will be used.

Terrorism is defined in the Code of Federal Regulations as "the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives. It is the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion, or ransom".

To count as terrorism, an action must be violent or threaten violence and it must be carried out for political, economic, religious, or social purposes. By contrast, violent acts committed without a political, economic, religious or social goal are not classified as terrorism, but instead as violent crimes.[107]

State and local governments have primary responsibility in planning for and managing the consequences of a terrorist incident using available resources in the critical hours before Federal assistance can arrive. If a terrorist incident occurs in a city or county, communities may receive assistance from federal agencies under the existing Integrated Emergency Management System. The Department of Homeland Security is the lead federal agency for supporting state and local response to the consequences of terrorist attacks.[108]

The term terrorism is often categorized as either domestic, international, or lone wolf.

Domestic terrorism

The U.S. Patriot Act defines domestic terrorism as an attempt to "intimidate or coerce a civilian population; to influence the policy of a government by intimidation or coercion; or to affect the conduct of a government by mass destruction, assassination, or kidnapping".

Domestic terrorism involves groups or individuals whose terrorist activities are directed at elements of the U.S. government or population without foreign direction. It is the unlawful use, or threatened use, of violence by a group or individual based and operating entirely within the United States, or its territories, without foreign direction, committed against persons or property to intimidate or coerce a government, the civilian population, or any group, in furtherance of political or social objectives. This can also include single issue groups looking to promote specific ideas or practices.[109]

International terrorism

International terrorism involves groups or individuals whose terrorist activities are foreign-based and/or directed by countries or groups outside the United States or whose activities transcend national boundaries. This distinction refers not to where the terrorist act takes place but rather to the origin of the individuals or groups responsible for it.

For the purposes of consequence management, the origin of the perpetrator(s) is of less importance than the impacts of the attack on life and property; thus, the distinction between domestic and international terrorism is less relevant for the purposes of mitigation, preparedness, response, and recovery than for understanding the capabilities of terrorist groups and how to respond to the impacts they can generate.

[107] https://ourworldindata.org/terrorism
[108] https://www.fema.gov/pdf/plan/managingemerconseq.pdf
[109] https://archives.fbi.gov/archives/news/testimony/the-terrorist-threat-confronting-the-united-states

Lone Wolf

Lone wolf terrorism is used to describe violent acts committed by a single perpetrator. The person acts independently and without the help of outside organizations. A lone wolf terrorist may, however, follow the ideology of a particular organization or group and may commit acts of terror to show their support of said group. Many of these individuals appear to be alone but have some level of contact with extremists who influence their actions. Additionally, many of these individuals exclude themselves, or feel excluded, from normal social interactions and day to day relationships. In their social exclusion, lone individuals feel deprived of what they perceive as values to which they are entitled, and form grievances against the government or people who they feel are responsible for their problems, such as unemployment, discrimination, and injustices. Their violence is also a means to achieve their goals and punish those responsible. [110]

Furthermore, the method in which terrorists carry out their plans vary from attack to attack. This includes chemical, biological, nuclear, environmental, bombing, cyber-attack, and active shooter attacks.

Chemical

Chemical terrorism is the deliberate release of certain chemicals that could poison people, animals, plants, or the environment. Chemical terrorism agents are poisonous vapors, aerosols, liquids, or solids that have toxic effects. They can be released by bombs, sprayed from aircraft, boats, or vehicles, or used as a liquid to create a hazard to people and the environment.[111]

Most chemical agents, depending on their type, concentration, and length of exposure, can be deadly. These chemicals can be categorized by type or by their effect. The Center for Disease Control (CDC) categorizes the following types:

- Anticoagulants – cause uncontrolled bleeding
- Biotoxins – come from plants or animals
- Blister Agents – blister the eyes, skin, or throat and lungs
- Blood Agents – absorbed into the blood
- Caustics – burn on contact
- Choking, Lung and Pulmonary Agents
- Incapacitating Agents – alter consciousness or thinking
- Metallic Poisons
- Nerve Agents – prevent the nervous system from functioning properly
- Organic Solvents – damage living tissue by dissolving fats and oils
- Tear gas and riot control agents
- Toxic Alcohols
- Vomiting Agents

Some chemical agents may be odorless and tasteless. They usually have an immediate effect (a few seconds to a few minutes) or a delayed effect (several hours).[112]

Biological

Bioterrorism is the intentional use of poisons or agents derived from living entities such as bacteria, viruses, and toxic plants. Biological agents can go undetected for hours to days. Signs and symptoms might initially look like a bad cold, flu, or other common illness. Some agents can be extremely lethal in very small

[110] https://www.ncjrs.gov/pdffiles1/nij/grants/248691.pdf
[111] https://www.upmc.com/services/poison-center/biological-chemical-terrorism/terminology
[112] https://www.upmc.com/services/poison-center/biological-chemical-terrorism/terminology

quantities. Biological weapons are categorized as either bacteria, viruses, or toxins.[113]

- Bacterial agents such as anthrax – Bacteria are organisms that reproduce by simple division. Although they may produce deleterious and potentially lethal effects on the body, the diseases they produce often respond to treatment with antibiotics.
- Viruses such as smallpox – Viruses require living cells in which to reproduce and are intimately dependent upon the body they infect. Viruses produce diseases (the common cold, for instance) that typically do not respond to antibiotics, although antiviral drugs are sometimes effective.
- Toxins such as toxic poisons derived from plants, animals and bacteria – Toxins (such as the botulism toxin from the bacteria Clostridium botulinum) are poisonous substances that are typically extracted from plants, animals or microorganisms. Pharmaceutically developed antitoxins and medications can treat some toxins.

All three types can potentially be deadly to people and animals. The CDC has classified the viruses, bacteria, and toxins that could be used in an attack. Category A Biological Diseases are those most likely to do the most damage. They include:

- Anthrax (Bacillus anthracis)
- Botulism (Clostridium botulinum toxin)
- The Plague (Yersinia pestis)
- Smallpox (Variola major)
- Tularemia (Francisella tularensis)
- Hemorrhagic Fever
- Ebola Virus

Nuclear

Nuclear terrorism refers to a number of different ways nuclear materials might be exploited as a terrorist tactic. This type of terrorism is an offense committed if a person unlawfully and intentionally "uses in any way radioactive material […] with the intent to cause death or serious bodily injury; or with the intent to cause substantial damage to property or to the environment; or with the intent to compel a natural or legal person, an international organization or a State to do or refrain from doing an act", according to the 2005 United Nations International Convention for the Suppression of Acts of Nuclear Terrorism.[114]

These include attacking nuclear facilities, purchasing nuclear weapons, building nuclear weapons or otherwise finding ways to disperse radioactive materials. There are low levels of radiation exposure present in the everyday environment, but the danger in a nuclear terrorist attack comes with the amount and type of radiation given off.

Given the number of capable groups with serious intent, the increasing accessibility of weapons or nuclear materials from which elementary weapons could be constructed, and the countless ways in which terrorists could smuggle a weapon across borders, nuclear terrorism has become a clear and present danger.

Nuclear terrorism can involve the use of Weapons of Mass Destruction (WMD's). Weapons of mass destruction are defined as (1) any destructive device as defined in 18 U.S.C., Section 2332a, which includes any explosive, incendiary, or poison gas, bomb, grenade, rocket having a propellant charge of more than four ounces, missile having an explosive or incendiary charge of more than one quarter ounce, mine or device similar to the above; (2) poison gas; (3) any weapon involving a disease organism; or (4) any weapon that is designed to release radiation or radioactivity at a level dangerous to human life.

[113] Ibid.
[114] https://fas.org/irp/congress/2008_rpt/suppression.html

The effects of a nuclear attack depend on how much radiation is received, how long someone is exposed to the radiation, and how the radiation entered the body.

Environmental and Eco-terrorism

There are two different types of terrorism related to the environment. On the one hand, environmental terrorism refers to one or more unlawful actions that harm or destroy environmental resources or deprive others of their use in order to intimidate or to coerce governments or civilians.[115] On the other hand, eco-terrorism describes violence in the interests of environmentalism. In general, eco-extremists sabotage property to inflict economic damage on industries or actors they see as harming animals or the natural environment. These have included fur companies, logging companies, and animal research laboratories. This can also be known as special interest terrorism.

Special interest terrorism differs from traditional right-wing and left-wing terrorism in that extremist special interest groups seek to resolve specific issues, rather than effect widespread political change. These groups continue to conduct acts of politically motivated violence to force segments of society, including the general public, to change attitudes about issues considered important to their causes. These groups occupy the extreme fringes of animal rights, pro-life, environmental, anti-nuclear, and other movements. Some special interest extremists, most notably within the animal rights and environmental movements, have turned increasingly toward vandalism and terrorist activity in attempts to further their causes.

Bombing

The easiest to obtain and use of all weapons is still a conventional explosive device, or improvised bomb, which may be used to cause massive local destruction or to disperse chemical, biological, or radiological agents.

Many of the devices used by terrorists today are Improvised Explosive Devices (IED's).[116] An IED is a homemade bomb or destructive device used to destroy, incapacitate, harass, or distract. IED's are categorized as being explosive or incendiary, employing high or low filler explosive materials to explode or cause fires. IED's can come in many forms, ranging from small, easy to make pipe bombs to more sophisticated devices capable of mass damage and loss of life. These devices can be lightweight and easy to carry such as the backpacks of the Boston Marathon bombers; however, they can also be large enough that use of a vehicle to transport is necessary, such as the bombing of the Alfred P. Murrah Federal Building in Oklahoma City. IED's can also be made of numerous chemicals and hazardous materials and may include the use of shrapnel such as nails or ball bearings.

The components are readily available, as are detailed instructions to construct such a device. Large, powerful devices can be outfitted with timed or remotely triggered detonators and can be designed to be activated by light, pressure, movement, or radio transmission. The potential exists for single or multiple bombing incidents in single or multiple municipalities. Historically, less than five percent of actual or attempted bombings were preceded by a threat. Explosive materials can be employed covertly with little signature and are not readily detectable. Secondary explosive devices may also be used as weapons against responders and the public in coincident acts.[117]

Cyber-attacks

Cyber terrorism is the premeditated use of disruptive activities, or the threat thereof, against computers and/or networks, with the intention to cause harm or further social, ideological, religious, political or similar

[115] Alpas, Hami (2011). Environmental Security and Ecoterrorism. Springer. p. 16
[116] https://www.dhs.gov/xlibrary/assets/prep_ied_fact_sheet.pdf
[117] https://www.fema.gov/pdf/plan/managingemerconseq.pdf

objectives, or to intimidate any person in furtherance of such objectives. Cyberterrorists use information technology to attack civilians and draw attention to their cause. This form of terrorism could severely disrupt the U.S. financial sector and banking, communications, transportation systems, business operations, and all major government infrastructure that relies on computers and the Internet.

More often, cyberterrorism refers to an attack on information technology itself in a way that would radically disrupt networked services. For example, cyber terrorists could disable networked emergency systems or hack into networks housing critical financial information.[124] For more information on cyber-attacks please see the Cyber Incident Profile.

Active shooter

According to the FBI, an active shooter is an individual actively engaged in killing or attempting to kill people in a populated area.[118] Multiple active shooters is a group that participates in a random or systematic shooting spree demonstrating their intent to continuously harm or kill others. In most cases, active shooters use numerous types of firearms and there is no pattern or method to their selection of victims. Active shooter situations are unpredictable and evolve quickly, with most active shooter situations over within 10 to 15 minutes. Warning signs that someone may be planning an attack are:[119]

- Increasingly erratic, unsafe, or aggressive behaviors.
- Hostile feelings of injustice or perceived wrongdoing.
- Drug and alcohol abuse.
- Marginalization or distancing from friends and colleagues.
- Changes in performance at work.
- Sudden and dramatic changes in home life or in personality.
- Financial difficulties.
- Pending civil or criminal litigation.
- Observable grievances with threats and plans of retribution.

The Department of Homeland Security defines certain characteristics of an active shooter as the following:[120]

- Active shooters are likely to engage more than one target. They may target particular individuals, or they may be intent on killing as many randomly chosen people as possible.
- Active shooters often go to locations with high concentrations of people, such as schools, theaters, shopping centers, or other places of business.
- Active shooters often, but not always, are suicidal and may attempt suicide by police. Escape from the police is usually not a priority of an active shooter. Most active shooters do not attempt to hide their identity.
- Active shooters often have made detailed plans for the attack. In many cases, they are better armed that the police. They usually have some familiarity with the chosen location.

Additionally, the FBI notes some concerning behaviors that have been exhibited before mass shootings include:[121]

- Mental health – 62%
- Interpersonal – 57%
- Discussing attack – 56%

[118] https://www.fbi.gov/about/partnerships/office-of-partner-engagement/active-shooter-resources
[119] https://www.dhs.gov/sites/default/files/publications/dhs-pathway-to-violence-09-15-16-508.pdf
[120] https://www.alicetraining.com/active-shooter/
[121] https://qz.com/1456558/the-fbis-warning-signs-of-a-mass-shooter/

- Quality of thinking – 54%
- Suicidal ideation – 48%
- Poor work performance – 46%
- Poor school performance – 42%
- Threats or confrontations – 35%
- Inappropriate firearms use – 21%

Most shooters (77%) spent a week or more planning their attacks, during which time they exhibited some of the concerning behaviors. And more than half of the shooters exhibited "leakage," the FBI notes, a term for discussing the idea of committing a violent act with someone else.

The people most likely to notice concerning behaviors are the people who know the potential shooter best, either family, friends, or classmates. Often, they do not mention the concerning behavior to anyone who could help, or to anyone at all.

It is important to note that mental health is not synonymous with a diagnosis of mental illness. Instead, it indicates that the shooter has appeared to have been struggling with an issue like depression or anxiety in the year before the attack. Just some of them had ever been diagnosed with any sort of mental illness before the attack.[122]

3.16.2 Location & Extent

It is almost impossible to predict where and when a terrorist attack could occur. Generally, terrorists target densely populated or high-profile areas, making any of the county's urban areas a potential target. High-profile infrastructures such as government and state buildings, amphitheaters, amusement parks, ports, and airports are also at risk of a potential attack. Hernando County is considered to be vulnerable because the chief objective of a terrorist is to spread fear and create any type of damage. Hernando County is a tourist attraction with beaches, rivers, parks, and wildlife areas. Additionally, Hernando County has multiple festivals throughout the year which a great deal of people attend; therefore, any location within Hernando County has the potential to become a target of terrorism.

The effects of terrorism can vary significantly—from loss of life and injuries to property damage and disruptions in services such as electricity, water supply, public transportation, and communications. One way that governments attempt to reduce vulnerability to terrorist incidents is by increasing security at airports and other public facilities that could be considered as targets.

3.16.3 Previous Occurrences

Table 3-41 summarizes the major terrorism events in Hernando County and in the State of Florida from 2015 to present. As the county hosts several festivals and attracts tourism, events linked to festivals and tourist attractions have been included as well.

[122] https://qz.com/1456558/the-fbis-warning-signs-of-a-mass-shooter/

Table 3-47 - Terrorism Previous Occurrences 2015-2019

Date	Information
February 2015	Assailants set fire to the New Shiloh Christian Center in Melbourne, Florida. There were no casualties in the attack, but the church sustained $5,000 in damages. No group claimed responsibility for the incident; however, the assailants spray painted a swastika as well as the words "Allahu Akbar" on a nearby shed.
June 2016	An assailant armed with an assault rifle and a handgun opened fire on customers at Pulse, a gay nightclub, in Orlando, Florida. The assailant then held an unknown number of people hostage inside the nightclub for three hours. At least 49 people were killed, and 53 people were injured during the attack before the assailant was killed by police officers. The assailant, identified as Omar Mateen, had pledged allegiance to ISIL. Additionally, Mateen stated that he carried out the attack in retaliation for U.S. airstrikes in Iraq and Syria. ISIL also claimed responsibility for the incident.
July 2016	Assailants set fire to the Islamic Education Center in Tampa, Florida. There were no reported casualties in the attack. No group claimed responsibility for the incident.
August 2016	Assailants set fire to the Masjid Omar mosque in Tampa, Florida. There were no casualties in the attack. This was one of two attacks on the same mosque in 12 hours. No group claimed responsibility for the incident.
January 2017	An assailant opened fire at Fort Lauderdale-Hollywood International Airport in Fort Lauderdale, Florida. At least five people were killed, and six other people were injured in the assault. Esteban Santiago admitted that he had discussed his plans for the attack in various jihadi online chat rooms. Moreover, Santiago stated that the CIA was forcing him to view ISIL videos.
February 2017	Assailants set fire to the Daarus Salaam Mosque in Thonotosassa, Florida. There were no reported casualties in the attack. No group claimed responsibility; however, sources attributed the incident to anti-Muslim extremists.
March 2017	An assailant set fire to an Indian-owned convenience store in Port St. Lucie, Florida. There were no reported casualties, though the store was damaged in the attack. Richard Lloyd was arrested and confessed to carrying out the attack. Lloyd stated that he believed the store was owned by Muslims and that he wanted to "run the Arabs out of our country".
May 2017	An assailant, identified as Devon Arthurs, shot and killed Jeremy Himmelman and Andrew Oneschuk at their shared apartment in Tampa, Florida. He later held three people hostages at Green Planet Smoke Shop in Tampa. Arthurs claimed responsibility for the attack and stated that he had targeted Himmelman and Oneschuk, who were alleged neo-Nazis and fellow members of the Atomwaffen Division, because they planned to carry out terrorist attacks that he wanted to prevent. Arthurs also claimed that he was frustrated about global anti-Muslim sentiment and United States airstrikes in the Muslim world. Officials later found Arthurs' garage stocked with bomb materials.
October 2017	A man in a high floor of a hotel opened fire on a country music festival in Las Vegas, Nevada happening outside, killing 58 people and injuring 851 others, with 422 of them suffering from gunshot wounds. The man then shot himself.[123]

[123] https://www.businessinsider.com/timeline-shows-exactly-how-the-las-vegas-massacre-unfolded-2018-9

February 2018	An assailant armed with a semi-automatic rifle entered Building 12 at Stoneman Douglas High School and opened fire at students and teachers in Parkland, Florida. At least 17 people were killed, and 17 other people were injured in the assault. The assailant escaped the building and was arrested a few hours later. Authorities identified the assailant as Nikolas Cruz, noting that he possessed "racist, homophobic, and anti-Semitic views" and that he had etched swastikas into his ammunition magazine.
March 2018	An assailant at a sleepover stabbed three people in a neighborhood in Palm Beach Gardens, Florida. At least one person was killed, and two others were injured. Corey Johnson claimed responsibility. He allegedly contacted members of the ISIL and was interested in joining the group.
August 2018	David Katz was attending a Madden NFL 19 video game tournament in Jacksonville, Florida and opened fire with two handguns, killing two, injuring 10, before turning the gun on himself.[124]
October 2018	A letter bomb addressed to former attorney general, Eric H. Holder, was discovered and defused at the office of Democratic Representative Debbie Wasserman Schultz in Sunrise, Florida. This was one of the 16 coordinated bomb attacks between October 22, 2018 and November 1, 2018 targeting critics of Donald Trump. Cesar Sayoc was arrested in connection with the incidents. Sayoc's vehicle was covered in right-wing paraphernalia.
November 2018	An assailant entered a yoga class and opened fire in Tallahassee, Florida. At least two people were killed, and five others were injured before the assailant killed himself. He was a far-right extremist.
July 2019	A gunman killed 3 people, including one 6-year-old boy, attending Gilroy's, California annual Garlic Festival; 15 more people were injured. The shooter killed himself.[125]
August 2019	A 16-year-old student was arrested for allegedly posting a mass shooting threat on Snapchat. The FBI had received information from Snapchat that someone posted a picture that contained an assault type rifle lying on a bed, along with a threatening caption referring to Central High School in Hernando County.[126]
June, 2020	A gunman began shooting in Guiseppe's Pizzeria in Sebastian, FL, killing one person. The shooter was apprehended at the scene. [127]
July 2020	In Tampa, a gunman wounded 5 people including a law enforcement officer in multiple locations across the city. The shooter was apprehended.[128]
September 2020	At a block party, a shooter wounded 6 people in Williston, FL. The unidentified shooter remains at large.[129]
June 2021	In Royal Palm Beach, a shooter killed two people in a Publix grocery. The gunman died by suicide at the scene. [130]
August 2021	A gunman began shooting patrons in a Miami Beach restaurant, killing one person before being arrested at the scene. [131]

[124] https://www.espn.com/esports/story/_/id/24686074/the-madden-tournament-shootingjacksonville-look- happened
[125] https://time.com/5637378/gilroy-garlic-festival-shooting-what-we-know/
[126] https://www.abcactionnews.com/news/region-citrus-hernando/student-arrested-for-posting-mass-shooting-threat-on-snapchat
[127] U.S. Department of Justice, *Active Shooter Incidents in the United States 2020*, July 2021
[128] Ibid.
[129] Ibid.
[130] U.S. Department of Justice, *Active Shooter Incidents in the United States 2021*, May 2022
[131] Ibid.

September 2021	Outside an Orlando nightclub, a gunman injured 4 people including a security guard before being apprehended at another location. [132]
February 2022	In a Fort Lauderdale sports bar, a shooter remains at large despite wounding 4 people.[133]
March 2022	Two people were killed and two wounded after a gunman targeted people at a transit bus in Fort Lauderdale, FL. The shooter was arrested at the scene. [134]
December 2022	At multiple locations in Orlando, a gunman injured two people including a security guard. The shooter was arrested at another location. [135]
August 2023	A gunman with two firearms began shooting at people at a Dollar General in Jacksonville, FL. Three people – an employee and two customers – were killed, and the shooter died by suicide at the scene. [136]
September 2023	A gunman began shooting people in vehicles in Sandestin Golf and Beach Resort in Miramar Beach Florida, killing one person and injuring another. The shooter was apprehended at another location. In Lakeland Florida, a gunman traveled to two separate residences and killed 4 people. The shooter was arrested at the scene. [137]

3.16.4 Probability

There is no sure way to predict future terrorism events as most typically occur without warning. The probability of a major terrorist event in the State of Florida is perceived to be high, and planning must be done as part of the larger national DHS initiatives. The Florida Department of Law Enforcement (FDLE) plays a large part in providing the state with critical intelligence and serves as a prevention measure to the state.

While one can never predict what target a terrorist will choose, the following are some of the factors many use when selecting a target:

- Produce a large number of victims.
- Cause mass panic.
- Target locations that have symbolic or cultural value, and areas where large groups congregate.
- Garner the greatest possible media attention.

The probability of a Terrorism Incident affecting Hernando County or the City of Brooksville is Likely with an annual probability between 10 and 100%.

[132] U.S. Department of Justice, *Active Shooter Incidents in the United States 2021*, May 2022
[133] U.S. Department of Justice, Active Shooter Incidents in the United States 2022, April 2023
[134] Ibid.
[135] Ibid.
[136] U.S. Department of Justice, *Active Shooter Incidents in the United States 2023*, June 2024
[137] Ibid.

3.16.5 Summary of Impacts

The many forms of terrorism have the capability of affecting both the state and the county in multiple ways:

Public

Witnesses are at risk of PTSD and survivor's guilt following a large-scale attack. Fear throughout the affected community and the country is high, causing a hazardous environment. Civilians are a target for attacks and are at risk. Civilians who gather in highly populated areas increase their risk of being targeted. Vulnerable communities and minorities are at higher risk of being victims of a hate crime. Exposure to Hazardous Materials is a possibility and could affect the nearby population. Lack of clean running water can cause unsanitary conditions and dehydration.

Responders

First responders are at risk of PTSD and other health issues following a violent attack. First responders are a target for second wave attacks and are at risk during rescue operations. Exposure to Hazardous Materials is a possibility and could affect first responders. Lack of communication and disruption of critical services can delay emergency response times.

Continuity of Operations (including continued delivery of services)

Tourism can decline following an attack and could cause loss of revenue to a community and to the economy. Airports in surrounding areas may close causing delays, leaving travelers stranded. Streets blocked with debris or closed due to proximity can cause street congestion and slow down response times and evacuation routes. Public transportation disruptions can cause stranded civilians not being able to evacuate. Bridges could be closed causing issues evacuating and responding. Train disruptions can cause delays and stranded passengers. Communication grid overload can cause the system to crash following a large attack. Damage to phone lines can cause issues getting information and calling for emergency services. Loss of Internet can affect numerous industries and emergency response.

Property, Facilities, Infrastructure

Bridges could be destroyed or damaged causing issues evacuating a community. Train tracks could be damaged or destroyed causing further delay in passengers and cargo being transported. Cars in the vicinity could be damaged or destroyed. Roads can be damaged or destroyed causing prolonged delays and reduced access for evacuation. Damage to buildings can include collapse (full/partial), Window blow out, and fire. Damage or destruction of government buildings could delay necessary services for the community. Damage or destruction to critical infrastructure such as places of travel, banks, and utilities could cause stress and hardship within the community. Outages can be widespread. Damage to power grid can prolong outages.

Environment

Exposure to Hazardous Materials is a possibility and could affect the environment and wildlife. Could contaminate the food and water sources. Damage to green spaces. Could result in long-term contamination, wreaking havoc on both the state and national economies.

Economic Condition

Prolonged loss of revenue could cause businesses to close and the economy to suffer. Loss of wages could affect citizens' ability to buy necessities and could affect the economy. The economy (business, personal, and government) could be affected if banks are closed or not being able to access the Internet.

Public Confidence in the Jurisdictions Governance

Lack of communication from leadership to the public. The public may lose confidence based on the evacuating timeframe, response timeframe, or the recovery timeframe. Not stopping an attack could lead to a loss of respect or confidence.

Hazard Ranking

The LMS Planning Committee determined terrorism to be a medium priority hazard in Hernando County. As described in the profile above, the probability of a terrorism is Possible with an annual probability between

1% and 10%. The probable hazard impact for terrorism is critical, with the potential form multiple deaths or injuries. Table 3-48 outlines the hazard rankings for each of the hazard priority criteria related to terrorism.

Table 3-48 – Vulnerability Scorecard

Frequency	Ranking of how often hazard occurred in the past. 2 - Likely: every 5-10 years
Probability	Ranking of the likelihood of the hazard occurring in the future. 2 - Likely: every 5-10 years
Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 2 - Medium: injuries recorded, but no deaths Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to the hazard occurrence. 1 - Low: little to no impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 1 - Low: little to no damage to environment recorded
Total Points	**8**

3.16.6 Vulnerability Analysis

Hernando County hosts several festivals on an annual basis. Additionally, there have been several security threats to community schools, although these have been resolved without incident. It is impossible to determine a jurisdiction's vulnerability, however it is reasonable to claim that every county is somewhat vulnerable to a terrorism incident occurring. Additionally, a loss estimation is difficult to determine because of several unknown variables, but it is reasonable to claim that losses could range from minimal, to extreme, depending on the magnitude of the event.

3.17 Biological Incident

3.17.1 Description

Hernando County is vulnerable to biological incidents caused by bacteria, viruses and toxins which occur in nature and those that are intentionally released. Biological incidents occur naturally from existing and emerging illnesses like seasonal influenza or Zika virus. While bioterrorism involves the intentional enhancement and release of organisms intended to scare, disrupt, injure, contaminate, and kill. Humans, livestock, crops, the built environment, wildlife, and natural habitat are at risk depending on the organism and how it is spread.[138] Biological incidents may also disrupt civil, economic, and political systems as seen in the West Africa Ebola epidemic in which 27,000 people were infected, 11,000 died, and the illness caused an impact equal to 5% of GDP in 2014 and 12% in 2015 in Guinea, Sierra Leone, and Liberia.[139]

Surveillance

Health, medical, mental health, veterinary, and public health providers are primarily responsible to manage the consequences of routine illness and biological threats. This is accomplished by tracking disease patterns and outbreaks, legal reporting of certain illnesses, follow-up care, and containment tactics to stop the spread of illness. Unlike a chemical or nuclear attack, evidence of a biological attack may take hours, days, or even

[138] CDC.Gov/anthrax/bioterrorism/index

[139] http://documents.worldbank.org/curated/en/541991468001792719/The-economic-impact-of-Ebola-on-sub-Saharan-Africa-updated-estimates-for-2015

weeks to appear. Illnesses are detected by health care providers, when people, animals, or plants show symptoms, when laboratory tests reveal illness, by tracking disease trends, and by sampling air, water and soil. For example, the first bioterrorism-related anthrax case in the United States was identified on Oct. 4, 2001, in two Palm Beach County, FL, employees of AMI Publishing Company. The epidemiology investigation indicated the employees were exposed to intentionally contaminated mail. [140]

Containment

Health and medical partners play key roles in early detection which helps establish a common operating picture of the disease, the case definition, its virulence, and the spread. Constant communication is then needed to maintain situational awareness of cases, contacts, quarantine of those sick, culling of contaminated livestock or crops, and isolation of those possibly exposed. Resources are deployed to protect workers, decontaminate or sanitize, educate the public, enforce social distancing, develop and vaccinate, and administer post-exposure treatment.[141]

Terminology

Many of the same terms, response tactics, and mitigation strategies apply to the description and management of naturally-occurring, emerging, and intentionally-caused biological incidents. The following terms are useful to understand biological mitigation.

Case refers to a countable instance of a particular disease, health disorder, or condition under investigation. Sometimes, an individual with the particular disease.[142]

Cluster refers to an aggregation of cases grouped in place and time that are suspected to be greater than the number expected, even though the expected number may not be known.[143]

Contact is exposure to a source of an infection, or a person so exposed.[144]

Containment – Containment strategies may be launched at the first sign of a problem, and help keep new, emerging, rare or ordinary illnesses and diseases from spreading. Containment complements other epidemiology response tactics including antibiotics, antivirals, vaccinations, education, awareness, environmental, personal protective gear, and administrative controls.[145]

Control is a reduction in the incidence, prevalence, morbidity or mortality of an infectious disease to a locally acceptable level.[146]

Emerging Illness includes outbreaks of previously unknown diseases, known diseases that are rapidly increasing in incidence or geographic range in the last 2 decades, and the persistence of infectious diseases that cannot be controlled.[147]

Endemic refers to the constant presence and/or usual prevalence of a disease or infectious agent in a population within a geographic area.

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[140] https://www.cdc.gov/anthrax/resources/history/; https://wwwnc.cdc.gov/eid/article/8/10/02-0354_article

[141] Biological Attack: A fact sheet from the National Academies and the U.S. Department of Homeland Security, 2004; Reportable Diseases/Conditions in Florida, FL Dept. of Health, 2016, http://www.floridahealth.gov/diseases-and-conditions/disease-reporting-and- management/_documents/reportable-diseases/_documents/reportable-diseases-list-practitioners.pdf

[142] http://www.cs.columbia.edu/digigov/LEXING/CDCEPI/gloss.html

[143] https://www.cdc.gov/csels/dsepd/ss1978/lesson1/section11.html

[144] http://www.cs.columbia.edu/digigov/LEXING/CDCEPI/gloss.html

[145] https://www.cdc.gov/hai/containment/index.html

[146] https://www.who.int/bulletin/volumes/84/2/editorial10206html/en/

[147] https://www.hopkinsmedicine.org/health/conditions-and-diseases/emerging-infectious-diseases

Epidemics occur when an agent and susceptible hosts are present in adequate numbers, and the agent can be effectively conveyed from a source to the susceptible hosts.[148]

Isolation separates sick people with a contagious disease from people who are not sick.[149]

Outbreak carries the same definition of epidemic, but is often used for a more limited geographic area.

Pandemic refers to an epidemic that has spread over several countries or continents, usually affecting a large number of people.[150]

Quarantine separates and restricts the movement of people who were exposed to a contagious disease to see if they become sick.

Surveillance is the systematic collection, analysis, interpretation, and dissemination of health data on an ongoing basis, to gain knowledge of the pattern of disease occurrence and potential in a community, in order to control and prevent disease in the community.[151]

Diseases and Illness

Biological agents may be rarely seen in the United States, occur and emerge naturally, or may be enhanced to pose a larger risk to national security.[152] Florida Statutes invest public health officials with the authority to monitor, respond, and contain biological threats. The Florida State Surgeon General may issue a Public Health Advisory as a warning of potential threats or declare a Public Health Emergency when a disease threatens to or poses a substantial harm to the public. Threat indicators may include sharp increase in rate of an illness, the effects of the illness intensify, it becomes easier to transmit a disease, there is a lack of immunity, or an overt threat is made or discovered.[153] Naturally-occurring outbreaks and increases in rates of illness are not uncommon. For example, several naturally-occurring, human-caused, and emerging illnesses have risen to the level of statewide public health advisories and emergencies including H1N1 influenza in 2009; a meningitis outbreak related to a compounding pharmacy in 2012; the Ebola outbreak beginning in 2014; the emergence of Zika in 2016, the rise in hepatitis A cases starting 2018 and declared in 2019.[154] Additional threats are emerging from ever-changing viruses and migrating diseases (seasonal influenza A virus, Bourbon Virus, Chikungunya, SARS, Dengue Fever, MERS); waning immunity from eradicated viruses and anti-vaccination sentiments (smallpox and Measles); anti-microbial resistance (HIV, MRSA, Tuberculosis, and Madagascar plague), and agricultural and animal pathogens (British foot-and-mouth-disease).[155]

Biological Terrorism

Mitigation of biological incidents can easily focus on the human-caused and intentional release of pathogens or biotoxins against people, plants, and animals to kill, injure, cause fear, and to disrupt civil society, the economy or political systems.[156] Although biological terrorism is not as common as naturally occurring and emerging biological diseases, it is useful to understand how the CDC defines biological agents that may be intentionally weaponization or distributed.[157] Category A Agents are easily

[148] https://www.cdc.gov/csels/dsepd/ss1978/lesson1/section11.html
[149] https://www.cdc.gov/quarantine/index.html
[150] https://www.cdc.gov/csels/dsepd/ss1978/lesson1/section11.html
[151] http://www.cs.columbia.edu/digigov/LEXING/CDCEPI/gloss.html
[152] https://emergency.cdc.gov/agent/agentlist-category.asp; https://www.cdc.gov/ncezid/who-we-are/index.html
[153] http://m.flsenate.gov/statutes/381.00315

[154] http://www.floridahealth.gov/newsroom/2019/08/080219-state-of-florida-department-of-health- declaration-of-public-health-emergency.pr.html ; http://martin.floridahealth.gov/newsroom/2019/08/hepa_state_update_080219.html
[155] Reassessing Biological Threats: implications for Cooperative Mitigation Strategies; Frontiers in public health, Nov. 30, 2015: 3: 251; doi: 10.3389/fpubh.2015.00251
[156] Biological Attack: Human Pathogens, Biotoxins, and Agricultural Threats; News and Terrorism, DHS, NAS, 2004
[157] https://emergency.cdc.gov/agent/agentlist-category.asp

disseminated or transmitted from person to person; result in high mortality rates and have the potential for major public health impact; might cause public panic and social disruption; and require special action for public health preparedness.

- Anthrax (*Bacillus anthracis*)
- Botulism (*Clostridium botulinum* toxin)
- Plague (*Yersinia pestis*)
- Smallpox (variola major)
- Tularemia (*Francisella tularensis*)
- Viral hemorrhagic fevers, including
    - Filoviruses (Ebola, Marburg)
    - Arenaviruses (Lassa, Machupo)

Category B Agents are moderately easy to disseminate; result in moderate morbidity rates and low mortality rates; and require specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance.

- Brucellosis (*Brucella* species)
- Epsilon toxin of *Clostridium perfringens*
- Food safety threats (Salmonella species, *Escherichia coli* O157:H7, *Shigella*)
- Glanders (*Burkholderia mallei*)
- Melioidosis (*Burkholderia pseudomallei*)
- Psittacosis (*Chlamydia psittaci*)
- Q fever (*Coxiella burnetii*)
- Ricin toxin from *Ricinus communis* (castor beans)
- Staphylococcal enterotoxin B
- Typhus fever (*Rickettsia prowazekii*)
- Viral encephalitis (alphaviruses, such as eastern equine encephalitis, Venezuelan equine encephalitis, and western equine encephalitis])
- Water safety threats (*Vibrio cholerae*, *Cryptosporidium parvum*)

Category C Agents include emerging pathogens that could be engineered for mass dissemination in the future because of availability; ease of production and dissemination; and potential for high morbidity and mortality rates and major health impact.

- Nipah virus
- Hhantavirus

3.17.2 Location & Extent

All of Hernando County could be affected by a Biological Incident. Areas where major transportation networks intersect such as Brooksville and commercial areas along Interstate 275 are more likely to experience these incidents and would likely be the first to experience these incidents because of the large population and high numbers of travelers. Tourist attractions such as Weeki Wachee Springs State Park may also be susceptible to Biological Incidents, due to a large number of travelers.

3.17.3 Previous Occurrences

Disease outbreaks and emerging illnesses can be traced across recorded human history. Warfare and conflict where biological weapons were deployed account for hundreds of thousands of casualties and deaths. Meanwhile, humans and animals are vulnerable to human-caused attacks and emerging diseases to which they have little or no immunity. The world remains vulnerable to illness and disease spread by travel,

commerce, unintentional exposures, cross-species transmission, and intentional use of biological agents. All of Hernando County could be affected by a Biological Incident.

Table 3-49 - Historical Occurrences, Biological Terrorism[158]

Date/Time Period	Description
600 BC	Solon uses the purgative herb hellebore during the siege of Krissa
1155	Emperor Barbarossa poisons water wells with human bodies in Tortona, Italy
1340's	Europeans threw plague-infected cadavers over city walls to infect those within.
1346	Tartar forces catapult bodies of plague victims over the city walls of Caffa, Crimean Peninsula (now Feodosia, Ukraine)
1495	Spanish mix wine with blood of leprosy patients to sell to their French foes in Naples, Italy
1675	German and French forces agree to not use "poisonous bullets"
1710	Russian troops catapult human bodies of plague victims into Swedish cities
1763	British distribute blankets from smallpox patients to Native Americans
1797	Napoleon floods the plains around Mantua, Italy, to enhance the spread of malaria
1863	Confederates sell clothing from yellow fever and smallpox patients to Union troops during the US Civil War
World War I	Germans infected Allied livestock with anthrax and glanders.
World War II	Unit 731 in Manchuria dropped plague infected fleas in Japanese controlled area in China, which led to more than 50,000 deaths.
World War II	Japan uses plague, anthrax, and other diseases; several other countries experiment with and develop biological weapons programs
1984	Cult followers of Baghwan Shree Rajneesh sickened 751 people in Oregon with salmonella bacteria in salad bars in 10 restaurants, intended to keep people from voting in the election.
1980–1988	Iraq uses mustard gas, sarin, and tabun against Iran and ethnic groups inside Iraq during the Persian Gulf War
1990s	The cult Aum Shinrikyo attempted and failed to release anthrax and botulinum toxin in Tokyo. The cult did succeed in carrying out a chemical attack with Sarin nerve agent.
1995	Aum Shinrikyo uses sarin gas in the Tokyo subway system
2001	Anthrax attacks through the US mail infected 11 people, 5 of which died, with inhalational anthrax. An additional 11 people were infected with skin anthrax.
2012	In 2012, a multi-state outbreak of fungal meningitis was investigated by the CDC, FDA and local health departments and traced back to a compounding pharmacy in Massachusetts which distributed contaminated preservative-free MPA steroid injections. Ultimately, 753 people were identified with illness in 20 states and 64 people died.

[158] Enhanced State Hazard Mitigation Plan, State of Florida, 2018; Florida Department of Health, Hernando County

Table 3-50 - Historical Occurrences, Outbreaks[159]

Date/Time Period	Description
1. The Black Death[160]	A plague so devastating that simply saying "The Plague" will immediately pull it to the front of your mind, in the middle of the 14th century—from 1347 to 1351—the Black Death remade the landscape of Europe and the world. In a time when the global population was an estimated 450 million, at least 75 million are believed to have perished throughout the pandemic, with some estimates as high as 200 million. As much as half of Europe may have died in a span of only four years. The plague's name comes from the black skin spots on the sailors who travelled the Silk Road and docked in a Sicilian port, bringing with them from their Asian voyage the devastating disease, now known to be bubonic plague.
2. 1918 Spanish Flu[161]	Approximately 90 years before the 2009 swine flu pandemic killed more than 200,000 people[162], reports of an especially dangerous form of influenza began to appear around the world. Kansas was the site of the first U.S. case, in March 1918. Appearing in multiple countries around the world, the disease spread quickly, ushered along even faster due to the close living quarters of troops fighting in World War I. This first instance of an H1N1 pandemic would be dubbed The Spanish Flu (despite the fact that it didn't actually come from Spain). It burned out quickly and suddenly, by 1919, with the explanation still unknown today. But it left the global population decimated—with a mortality rate as high as one in five and an estimated one-third of the world population afflicted, as many as 50 million people are believed to have died. Approximately 25 million of those deaths came in the first 25 weeks of the outbreak.
3. HIV/AIDS[162]	This is a pandemic we're still battling. And while medicine has made great strides, making HIV in many ways a chronic condition that can be managed in many countries, the end of the pandemic still seems to be a long way away. Originating in Cameroon and first recognized as a disease in 1981, the earliest documented case is believed to be in 1959 in the Congo. As of 2011 at least 60 million people had been infected by AIDS and 25 million had died. Today its impact varies widely across the world—while in 2008 an estimated 1.2 million Americans had HIV, Sub-Saharan Africa alone was home to 22.9 million cases, with one in five adults infected. About 35.3 million people were believed to have HIV in 2012.
4. The Plague of Justinian[163]	In the year 541, rats on Egyptian grain boats brought a pestilence to the Eastern Roman Empire that would ultimately leave approximately 25 million people dead. The Plague of Justinian quickly tore through the empire. Even the emperor himself—Justinian I, for whom the plague was named—contracted the disease. While he lived, many didn't, with modern scholars estimating that at one point as many as 5,000 people died per day in Constantinople, the empire's capital. By its end, about 40 percent of the city's population was dead—so many and so quickly that bodies were left in piles—joined by about one fourth of the eastern Mediterranean. Modern experts believe the outbreak to be the first recorded case of the bubonic plague.
5. The Antonine Plague[164]	Named for Roman Emperor Marcus Aurelius Antoninus, who ruled during the outbreak along with coregent Lucius Verus, the outbreak began in 165 and lasted until 180. An estimated five million people died from what is now thought to have been smallpox. It's believed to have begun in the Mesopotamian city of Seleucia (in modern-day Iraq) and spread to Rome by soldiers returning from the city's siege. At one point during the extended pandemic an estimated 2,000 Romans died each day. This isn't a plague that discriminated—both emperors mentioned above are believed to be among its victims.

[159] https://www.rwjf.org/en/blog/2013/12/the_five_deadliesto.html
[160] http://www.history.com /topics/blackdeath
[161] http://www.flu.gov /pandemic/history/
[162] http://perspectivesinmedicine .org/content/1/1/a006841.full.pdf+
[163] http://www.ancient.eu/article/782/
[164] http://www.infectiousinformation .com/sample-page/theantonine-plague/

Cholera[165]	Honorable mention: There's no one outbreak of cholera to point to that's on the level of any of the above five pandemics. However, since first spreading from Calcutta along the Ganges Delta in 1817, it has killed millions. The World Health Organization estimates that each year that passes sees between 3 and 5 million new cholera cases, killing as many as 120,000 people. Untreated, it can kill in a matter of hours. Cholera is also notable for the role a specific outbreak played in the development of modern epidemiology. English physician John Snow published his "On the Mode of Communication of Cholera"[166] in 1849, updating it in 1855 with lessons he'd learned the year before. During the 1854 Broad Street cholera outbreak in the Soho district of London, Snow had—based on his theory that cholera was transmitted by exposure to contaminated water—used extensive interviews and intricately plotted maps to trace the source of the outbreak to a single water pump. Disabling the pump ended the outbreak almost immediately, in a poignant example of an early, effective public health intervention.
2009 H1N[167]	In the spring of 2009, a novel influenza A (H1N1) virus was detected first in the United States and spread quickly across the United States and the world. This new H1N1 virus contained a unique combination of influenza genes not previously identified in animals or people. Internationally, 2009 H1N1 viruses and seasonal influenza viruses are co-circulating in many parts of the world. The 2009 H1N1 virus will likely continue to spread like a regular seasonal influenza virus.
2014 Ebola	In September of 2014, the first confirmed case of Ebola within the United States was documented. The man had traveled to Dallas, Texas from Liberia with no apparent symptoms. The patient passed away in October. In October 2014, two health care workers from Texas Presbyterian Hospital contracted the disease and have since recovered. A New York City health care worker returned home after contracting the disease in Guinea and has since recovered.
2016 Zika	In 2016, there were 1,122 cases of Zika virus and 118 cases in 2017. [168]
2019 hepatitis A	The number of hepatitis A cases has spiked across the United States in recent years, even though an effective vaccination has been available and widely used since the 1980's. In Florida, hepatitis A cases began to spike in 2018 and through 2020 to 3,125 cases up from 548 cases in 2018. In Hernando County, 122 cases have been reported between March 2018 and the present.170 County Health Departments across Florida are actively vaccinating at-risk residents (recently incarcerated, people who use drugs or are in recovery/rehabilitation, homeless); finding cases and contacts to provide treatment and vaccination; providing education, raising awareness of personal hygiene and sanitation. When cases are found, especially in situations where many people may have been exposed, the Florida Department of Health in Hernando County offers Hepatitis A vaccines outreach, clinics, and special hours.
2019 Novel Corona Virus	In January 2020, the CDC started closely monitoring an outbreak of respiratory illness caused by a novel (new) coronavirus in Wuhan, Hubei Province, China. China then confirmed thousands of cases and hundreds of deaths across the country. Additional cases are identified in 28 countries, with 11 cases in the US.[169] As of 5 February 2020, 777,664,564 laboratory-confirmed cases were reported globally with 7,091,788 deaths.[170] On January 30, 2020, the World Health Organization declared the outbreak an international concern. The US declared a public health emergency on January 31, 2020, and then suspended entry of persons who pose a risk of transmission.[171]

[165] http://www.who.int/ mediacentre/factsheets/fs107/en/
[166] http://www.ph.ucla.edu/epi/snow /snowbook.html
[167] https://www.cdc.gov/flu/pandemic-resources/2009-h1n1-pandemic.html
[168] https://www.dhs.gov/xlibrary/assets/prep_biological_fact_sheet.pdf
[169] https://www.cdc.gov/coronavirus/2019-ncov/
[170] https://data.who.int/dashboards/covid19/cases?n=o
[171] https://www.cdc.gov/coronavirus/2019-nCoV/summary.html

2024 Dengue[172]	In 2024, over 13 million cases of dengue fever reported across North, Central, and South America and the Caribbean, occurring particularly among travelers to those areas. These visitors return to their home communities and increase the likelihood of localized outbreaks in the United States. The most common mosquito-borne disease in the world, dengue has been reported to have transmitted locally in California, Texas, and Florida.
2025 Measles[173]	As of March 27, 2025, a total of 483 cases of measles were reported by 19 US states: Alaska, California, Florida, Georgia, Kansas, Kentucky, Maryland, Michigan, Minnesota, New Jersey, New Mexico, New York, Ohio, Pennsylvania, Rhode Island, Tennessee, Texas, Vermont, and Washington. 93% of confirmed cases are related to three outbreaks in 2025. The CDC reports 483 cases of measles with 33% of patients under the age of 5. Fourteen percent of cases include hospitalizations, including 25% of those patients under 5. This outbreak includes the first death from measles in a decade. [174]

Florida and Hernando County have experienced many recent outbreaks of disease and have made emergency preparations to manage the consequences of several others. Since Hernando County is not a large population center and does not contain significant government, military, or cultural targets its likelihood of experiencing a targeted attack is low. But, Hernando County along with the state is at moderate risk of impacts from naturally occurring illnesses. Lastly, Hernando County may experience an influx of in-state migration if residents and visitors flee other areas more heavily affected or intentionally targeted.

3.17.4 Probability

Based on the previous occurrences described above, it is likely that other diseases will affect Hernando County. The probability of a biological incident is Likely with between a 10% and 100% annual probability.

3.17.5 Summary of Impacts

Public

The public may be impacted during a biological incident. Members of the public may be injured, incapacitated, or die from exposure. Biological incidents will likely cause a level of anxiety and fear in those affected and among the general population.

First Responders, health, medical, mental health care providers

First responders may be impacted by an increased risk of exposure, illness, injury or death from exposure during a biological incident. Some of these impacts may be mitigated with education, training, lessons learned from previous incidents, pre-event vaccination, post-exposure prophylaxis, personal protective equipment, and engineering controls.

Continuity of Operations

During a biological incident essential and secondary services may be interrupted because of employee absenteeism, interruptions in supply chains, incapacitated communications and financial systems, and other infrastructure damages. Business locations and portions of the county may be contaminated, or access may be limited which can impact commerce going into and coming out of the areas. Business continuity of operations may include temporary or permanent relocation.

Property, Facilities, Infrastructure

[172] https://www.cdc.gov/dengue/outbreaks/2024/index.html
[173] https://www.cdc.gov/measles/data-research/
[174] https://news.cuanschutz.edu/news-stories/texas-records-first-us-measles-death-in-10-years-a-medical-epidemiologist-explains-how-to-protect-yourself-and-your-community-from-this-deadly-preve-1740762632739

Aside from contamination, property, facilities and infrastructure are unlikely to be affected by a biological incident with contamination. However, absenteeism, illness and death among critical workforce may cause interruption in utilities, damage to critical infrastructure, and lapses in repairs and maintenance.

Environment

A biological incident could impact the environment if animals and crops are affected causing a drop in output and restricted access to areas of the county. Residual or long-term contamination may impact the community for many months or years. A recent example is the Fukushima earthquake, tsunami, nuclear contamination. Environmental nuclear contamination caused widespread evacuation and abandonment in the area with residual radiation contamination making the area uninhabitable.

Economic Condition

If employee or consumer absenteeism is a major issue, businesses may be forced to close. As an example, when schools and day cares cannot operate, parents may be challenged to arrange childcare so they can continue working. This can lead to absenteeism and loss of jobs with employers that cannot accommodate family needs. Drops in public confidence, reduced spending, and difficulty traveling may all impact businesses that may struggle to survive the biological incident.

Public Confidence in the Jurisdictions Governance

During a biological incident the public may begin to doubt a jurisdiction's capabilities and take precautions themselves, perhaps dangerously. The general public may lose confidence in political and judicial governance which may result in changes in elected and appointed officials and a lack of trust in public information, and government's consequence management capabilities.

Hazard Ranking

The LMS Planning Committee determined biological incidents to be a low priority hazard in Hernando County. As described in the profile above, the annual probability of a biological incident is Likely. The potential impact of a biological incident is Minor with limited or focused injuries and only minor property damage. The spatial extent of a biological event is Small with the potential for between 1% and 10% of County's area being affected. The warning time for a biological incident is most likely to be more than 24 hours. The duration of a biological incident could be more than one week, may last months and may occur in repeated waves.

Table 3-51 – Vulnerability Scorecard

Frequency	Ranking of how often hazard occurred in the past. 2 - Likely: every 5-10 years
Probability	Ranking of the likelihood of the hazard occurring in the future. 2 - Likely: every 5-10 years
Magnitude	Injuries: Ranking of how many injuries and/or deaths have been recorded. 1 - Low: no injuries or deaths recorded Infrastructure/Economy: Ranking of the general impact on infrastructure and to the economy due to the hazard occurrence. 1 - Low: little to no impact or damage to infrastructure and economy recorded Environment: Ranking of general impact on the environment due to hazard occurrence. 1 - Low: little to no damage to environment recorded
Total Points	***7***

3.17.6 Vulnerability Analysis

It is impossible to determine a jurisdiction's vulnerability, however it is reasonable to claim that every county is somewhat vulnerable to a biological incident occurring. Additionally, a loss estimation is difficult to determine because of several unknown variables, but it is reasonable to claim that losses could range from minimal, to extreme, depending on the disease and the magnitude.

4.0 Mitigation Strategy

4.1 Overview

The planning process allows Hernando County and the City of Brooksville the opportunity to recognize the types of hazards facing Hernando County, determine the means to address these hazards, and join together to implement these means. Hazard mitigation planning allows the community to identify proactive mitigation strategies before such events occur. The importance of hazard mitigation planning must be placed in the context of policies, perceptions, and practices associated with hazards that impact the economic and physical wellbeing of Hernando County. Changes from the previous update reflect a greater emphasis on wildfire as a hazard.

4.2 Hernando County Goals and Objectives

The LMS Working Group developed three specific goals and associated objectives to guide its work and focus the efforts and resources to reduce hazard related losses and damage in the future. The goals and objectives were designed to be multi- hazard and to address the needs of all of the jurisdictions. These goals were reviewed by the LMS Working Group and have been updated to better align with county and municipal goals and objectives and may be achieved within the next 5-year planning cycle. With each 5-year update the Goals and objectives will be reviewed for consistency with county and municipal goals and measured by the outcomes of the previous five years.

The approved goals and objectives are:

Goal 1: Program for Public Outreach and Engagement

Objective 1.1: Provide education and information to the public about potential hazards and property protection measures.

Objective 1.2: Provide education and information to the business community to promote mitigation efforts.

Objective 1.3: Utilize print media, television, and radio and social media to educate the public on mitigation.

Objective 1.4: Annually provide outreach specifically to properties immediately adjacent to the repetitive loss properties as part of the Community Rating System outreach and Repetitive Loss and Severe Repetitive Loss Property Owner outreach programs.

Objective 1.5: Provide general public outreach at County events, including the Emergency Management Hurricane Expo and general presentations to community groups.

Goal 2: Promote a Disaster Resilient Community.

Objective 2.1: Ensure that critical services are protected.

Objective 2.2: Continue to retrofit public facilities to maintain sufficient shelter space

Objective 2.3: Prioritize and retrofit existing critical facilities and infrastructure.

Objective 2.4: Encourage participation in the National Flood Insurance Program and Hazard Mitigation Funding Programs

Objective 2.5: Continue enforcement of codes for new development and redevelopment to ensure compliance with all applicable federal, state and local regulations.

Objective 2.6: Prioritize mitigation projects whose benefits are broad (community vs. individual).

Objective 2.7: Ensure that mitigation projects produce long-term, cost-effective benefits.

Goal 3: Partner with the Florida Fire Service to maintain the Wildfire mitigation program.

Objective 3.1: Continue to maintain the Community Wildfire Protection Plan through the LMS Working Group.

Objective 3.2: Florida Forest Service will continue to work with Hernando County Fire Rescue and Hernando County Emergency Management to analyze the wildfire occurrences and deliver the appropriate educational campaign. The three main campaigns will focus on Fire Wise, Ready Set Go and Know the Law.

Objective 3.3: Identify potential wildfire projects that benefit as many residents as possible by mitigating impact to vulnerable areas and structures.

Object 3.4: Assist in the integration of hazard mitigation concepts into other local planning efforts.

Objective 3.5 Support the efforts of the Florida Forest Service and other agencies to reduce wildfire risks throughout the county.

Objective 3.6: Florida Forest Service will continue to train with Hernando County Fire Rescue and Hernando County Emergency Management yearly. Hernando County will strive to have 2 Fire Wise Communities by 2024.

4.3 Range of Mitigation Initiatives and Policies

The process of integrating the goals and objectives with the known hazards and vulnerabilities within Hernando County and the City of Brooksville was completed and reviewed for continued applicability in order to produce an updated series of specific mitigation actions relevant to protecting lives and properties in Hernando County. Incentives for implementing hazard mitigation initiatives are related to loss reduction, public welfare, or public safety. Disincentives are related to lack of funding, staff, or resources.

The updated risk assessment was created with the assistance of the planners, engineers and relevant staff who administer the following policies and regulations and will be available for evaluation and consideration when these policies are updated. Similarly, the programs and policies identified in Section 4.4 were collected with the help of the jurisdiction staff and community partners responsible for the administration of those programs. The LMS Working Group will continue to expand on the mitigation policies and programs by making the updated risk assessment available to policymakers and community partners, as well as encouraging continued participation on the LMS Working Group. Participation and consistent organization of the LMS Working Group has been a gap over the last five years. To increase the capability of Hernando County and the City of Brooksville over the past two years and in order to meet these mitigation initiatives, the County has increased emergency management staff, further encouraged participation of the public, and county and municipal staff, and held more consistent regular meetings of the LMS WG. The LMS WG has full participation and will continue to identify gaps and areas for expansion of the mitigation initiatives and policies.

The mitigation alternatives are linked to the County's goals and objectives and address the hazards risk and vulnerabilities identified by the risk assessment. These initiatives apply to new and existing building structures as well as new and existing infrastructure. The following is a list of goals objectives, and policies from the comprehensive plans of Hernando County, and the City of Brooksville where hazard mitigation goals and actions are incorporated:

HERNANDO COUNTY

Comprehensive Plan- Future Land Use Element

Strategy 1.04A The Rural Category retains and promotes agricultural activities, retains the rural nature and countryside character of a significant portion of the County including rural residential

uses with limited agricultural activities, limits residential density and infrastructure outside of recognized urbanizing areas as shown on the Adjusted Urbanized Area Map, and may be used to recognize properties with natural physical development limitations such as floodplains.

Strategy 1.04B(8) Mobile homes are recognized as an affordable housing choice in the Residential Category, providing for compatibility with surrounding land uses and served at the site by appropriate infrastructure and services in accordance with Residential Category standards. Direct access to an arterial or major collector roadway is required to facilitate emergency evacuation.

Strategy 1.04B(9) New zoning for mobile homes shall not be permitted in the Coastal Zone as defined in the Coastal Management Element of this Plan.

Strategy 1.04L(4)(e) The following issues will be considered by the School District when evaluating potential new school sites or significant renovations of existing schools: The proposed location is not within a velocity flood zone (V-zone), floodway, or the Coastal High Hazard Area (CHHA) as delineated in the adopted Comprehensive Plan of the County;

Strategy 1.05G(20): Drainage & Floodplain Management. Redevelopment in the South Brooksville area shall not impede the ability of drainage patterns and floodplain areas to function properly, or present risks of flooding or impeding drainage flow.

Strategy 1.08C(1) Planning for, and development along, Wiscon Road shall maintain the integrity of floodplain function and discourage the expansion of new commercial development.

Strategy 1.10A(4) The Planned Development Project (PDP) process shall be used for those land uses proposed in close proximity to incompatible uses where minimum standards will not sufficiently mitigate the potential land use conflict, such as residential developments near mining, commercial, industrial or conservation land use areas. In some cases, purchaser notification may be required where conflicts cannot be adequately mitigated through design, such as the presence of wildfire hazards.

Strategy 1.10A(5)(a) The County shall maintain land development regulations that implement the following land use standards pursuant to the guidance provided in this Plan, especially the Conservation Element, the Coastal Management Element, and the Utilities Element: new development shall be discouraged, or properly mitigated, in floodplains and flood prone areas;

<u>Comprehensive Plan - Coastal Management Element</u>

Objective 11.02A Hernando County has established a Coastal High Hazard Area (CHHA) where development is limited and regulated consistent with the provisions of this plan to protect private property rights in order to mitigate exposures to hazards and losses related to coastal storms and sea level rise and to responsibly manage the potential fiscal impacts and fiscal responses to the damage from such hazards.

Strategy 11.02A(1) Hernando County designates the Coastal High Hazard Area (CHHA) as the area below the elevation of the Category 1 storm surge line as established by the Sea, Lake and Overland Surges from Hurricanes (SLOSH) storm surge model, as updated from time to time by the Federal Emergency Management Agency (FEMA) or the Tampa Bay Regional Planning Council and as generally depicted on the Coastal High Hazard Area (CHHA) Map.

Strategy 11.02A(2) Hernando County floodplain protection regulations shall take into account the minimum requirements of the Florida Building Code and the National Flood Insurance Program (NFIP). The County regulations will be consistent with, or more stringent than, the flood resistant construction requirements of the Florida Building Code and applicable floodplain regulations set forth in 44

C.F.R. part 60.

Strategy 11.02A(3) Infill residential development in existing communities with existing infrastructure are permitted in the Coastal Zone, consistent with present densities, provided that all applicable federal, state and county zoning, construction and environmental regulations are met. All newly proposed residential development in the Coastal Zone is regulated as follows notwithstanding the underlying Future Land Use Map category:

a. Density in the Coastal High Hazard Area (CHHA) is restricted to one unit per gross acre, and, all allowable density must be sited within the upland portion of the property;
b. Density within the V-Zone Flood Insurance Rate Map (FIRM) category as designated by the Federal Emergency Management Agency (FEMA) and adopted Flood Insurance Rate Maps (FIRM) is restricted to 1 unit per upland acre and no density shall be transferred from or built within V-Zone wetlands;
c. Privately-owned uplands within the Coastal Zone that are designated as Conservation on the Future Land Use Map having direct access to the County roadway network may be considered to have a Residential Future Land Use Category designation for purposes of allowable uses, and, may be assigned an appropriate density consistent with the Residential Category, CHHA, or V-Zone designation as applicable.

Strategy 11.02A(7) The County encourages the use of best practices development and redevelopment principles, strategies, and engineering solutions that will result in the removal of coastal real property from flood zone designations established by FEMA. The County will identify and implement programs that minimize repetitive loss properties in the Coastal High Hazard Area (CHHA) and best practices to remove property from the designated flood zone including the following:

a. The potential for acquisition, with federal assistance, repetitive loss properties;
b. The prohibition of new mobile homes in the Coastal High Hazard Area (CHHA);
c. Flood mitigation projects that reduce vulnerability and/or remove property from the 100-year floodplain;
d. Stormwater maintenance and stormwater improvement projects;
e. A Local Hazard Mitigation strategy that includes programs to elevate and/or acquire vulnerable structures; and
f. The enforcement of floodplain management regulations and best practices.

Objective 11.02B Hernando County shall limit public investment in infrastructure in the CHHA and particularly in the V-Zone Flood Insurance Rate Map (FIRM) category as designated by the Federal Emergency Management Agency (FEMA). Public investment shall generally be limited to recreational and public access improvements, maintenance of existing infrastructure or upgrading of infrastructure where an environmental or service benefit exists.

Strategy 11.02B(1) Hernando County shall maintain an inventory of existing public infrastructure within the Coastal High Hazard Area (CHHA), develop a program to relocate or retrofit such facilities where necessary, and limit public expenditures in the CHHA or flood prone areas.

Strategy 11.02B(2) New infrastructure shall not be constructed to support new development in floodplains, flood prone areas and coastal high hazard areas, except as specifically provided for in this Plan.

Strategy 11.02B(3) New County-funded public recreational facilities built in the VZone shall be restricted to recreational uses with minimal potential for structural loss or damage, such as, but not limited to open space parks and boardwalks, picnic areas, athletic fields, swimming areas, and boat ramps.

Strategy 11.02B(4) New and replacement water and sewer facilities will be planned and implemented with the goals of centralization in order to retire wells and septic tanks, to locate treatment facilities outside the Coastal Zone, correct current deficiencies, reduce infiltration, serve existing communities, and to steer future population concentrations away from Coastal High Hazard Areas as defined in this Plan.

Strategy 11.02B(5) Public and private landfills of any kind are prohibited within the Coastal Zone.

Strategy 11.02B(6) Continue to upgrade stormwater infrastructure through drainage improvements, erosion control, and the use of sustainable flood management techniques such as pervious pavement, protection of natural areas and bioswales or other low impact development (LID) techniques.

Objective 11.02C Existing transportation corridors and those roadways accessing development in the CHHA shall be built and maintained to County standards to ensure that hurricane evacuation clearance times are not reduced.

Strategy 11.02C(1) The County shall not install new roadway lane miles on the functionally-classified network within the Coastal High Hazard Area (CHHA) unless required for evacuation purposes. Upgrades to existing roadways is limited to intersection improvements for safety reasons, accommodation of cyclists and pedestrians or to technological improvements that facilitate evacuation and maintain or improve evacuation clearance times.

Strategy 11.02C(2) Levels of service for hurricane evacuation clearance times as outlined in this Chapter, and, for roadways as outlined in the Transportation Element of this Plan, shall be achieved by limiting coastal populations and by adoption of evacuation procedures in the official county evacuation plan.

Objective 11.02D Hernando County shall reduce the exposure of development to natural coastal hazard impacts from high tide events, storm surge, flash floods, stormwater runoff and sea level rise through regulatory standards, hazard mitigation and post-disaster redevelopment planning.

Strategy 11.02D(2) Update the hazard and vulnerability data in the County's geographic information system (GIS) to facilitate the identification of mitigation opportunities and to facilitate smooth and accurate operation of recovery efforts following a hazard incident.

Strategy 11.02D(2) Hernando County shall implement a Local Mitigation Strategy (LMS) to identify and guide hazard mitigation activities including site development techniques and best practices that may reduce losses due to flooding and claims made under National Flood Insurance Program (NFIP) policies. Other techniques, strategies and best practices that will be used to reduce losses due to flooding and claims under the flood insurance program include the following:

a. Use of freeboard above the minimum elevation requirement;
b. Maintain records of elevation certificates;
c. Enforcement of up to date floodplain management regulations;

d. Maintain records of substantial improvements and substantial damage in the floodplain;
e. Participate in the Community Rating System (CRS)
f. Implement public outreach programs;
g. Implement buffer and open space regulations/programs;
h. Require floodplain compensation where development impacts the designated floodplain; and
i. Minimize infrastructure investments in the floodplain.

Strategy 11.02D(3) Hernando County shall adhere to the minimum requirements of the Florida Building Code and the County's Flood Damage Prevention Ordinance as they relate to reducing flood risk and mitigating damage from natural hazards.

Strategy 11.02D(4) Hernando County shall continue to participate in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) to lower the risk of community flood damage.

Hernando County recognizes the potential adverse impacts of sea level rise to private property, vulnerable populations, groundwater and natural resources, and public infrastructure. In reviewing proposals for development or redevelopment, consideration shall be given to:

a. project design in light of the required codes, engineering standards and best practices;
b. protection of natural vegetation, marsh species, wetlands, floodplains, and natural drainage features to ensure maximum adaptation to sea level rise;
c. analysis of projected impacts to infrastructure;
d. the projected rise in sea level by the National Oceanic and Atmospheric Administration (NOAH) or other professional accepted scientific studies;
e. adequate buffers from wetlands, rivers, streams and tidally influenced bodies of water;
f. a development pattern that maintains low density, conservation areas and protects natural areas;
g. documented extreme tides, flooding and rainfall events

Strategy 11.02D(6) Hernando County's Post-Disaster Redevelopment Plan (PDRP), as updated from time to time shall be the guiding document for actions and policies to be carried out in response to damage from natural or manmade disasters. The PDRP addresses short and long-term responses to damage incidents throughout the County.

Strategy 11.02D(7) The Plan and the land development regulations shall be updated as appropriate and as needed to address hazard mitigation and post-disaster redevelopment including:

a. review of building codes, development codes and permitting procedures to identify the potential need for updates that reduce the flood risk in coastal areas;
b. review of policies and codes for non-conforming structures and uses to ensure clear guidance for permitting and rebuilding in a safe manner after a disaster to ensure compliance with standards and design techniques that reduce the potential for damage and flooding;
c. evaluate the potential for purchase of repetitive loss and properties extremely vulnerable to storm surge and flooding;
d. identify restoration standards and procedures for damaged infrastructure that includes flood-proofing;
e. identified action items in the adopted PDRP, as updated from time to time, including the areas of business restoration, health and social services, government operations and environmental restoration;
f. methods, materials and practices that minimize flood damage;

g. restrict densities and uses with vulnerable populations (nursing homes, hospitals, assisted living facilities, etc.) in the CHHA and flood prone areas.

CITY OF BROOKSVILLE

Comprehensive Plan- Future Land Use Element

Policy 1-1: The City shall maintain a unified Land Development Code which will regulate: all land uses shown on the Future Land use Map, the subdivision of land, the location, size and the height of signage, areas subject to seasonal or periodic flooding, the type of land use proposed and the topography, soil conditions and the availability of facilities and services. [9J-5.006(3)(b)1] [9J-5.006(3)(c)1]

Policy 2-16: Discourage commercial activities from locating in wetlands, 100-year flood plains and delineated conservation areas through the use of proper site plan procedures and adopted flood plain management objectives and policies of this plan.

Policy 3-11: The City shall formally adopt Land use Element Maps which indicate 100-year flood hazard areas, ponding and wetlands areas, and stormwater drainage system conduits as City conservation areas until such time as a Master Stormwater Drainage Study is completed and adopted to specifically designate sites and acreages to be reserved for conservation use.

Objective 10: The City shall consider the elimination or reduction of future land uses that are inconsistent with the Hernando County Local Hazard Mitigation Strategy and other existing and future interagency hazard mitigation reports.

Policy 10-1: The City shall review interagency hazard mitigation reports as they become available to determine if actions are appropriate to eliminate or reduce future land uses that are inconsistent with the report.

4.4 Mitigation Programs and Policies

4.4.1 Preventive Measures

Preventive measures are designed to minimize the potential development of new natural hazard problems and are intended to keep existing natural hazard problems from becoming worse. Preventive measures also include mitigation actions to alleviate those known areas of concern to ensure that the issue does not continue to remain an area of concern. They ensure that future land development projects do not increase local and/or regional natural hazard damage potentials. Once completed, participating members integrate the data and mitigation goals into their existing plans. Preventive measures are administered by local building, zoning, planning, and/or code enforcement officials and include the following plans for Hernando County and the City of Brooksville:

- Comprehensive plans
- Land use planning/zoning efforts
- Subdivision and land development ordinances
- Capital improvement plans (CIP)
- Building codes
- Floodplain development regulations
- Stormwater management
- Operations and maintenance (O&M) procedures
- Subsurface investigation requirements
- Geographic Information Systems (GIS)
- Detailed plans and targeted studies
- Community Rating System programs
- Community Wildfire Protection Program guidance

4.4.2 Emergency Services

Emergency services measures protect people during and immediately following a natural hazard event. The County and municipalities have Emergency Operations Plans (EOP's) to formally document their emergency preparedness and response planning. The local EOP identifies standard operating procedures for various emergency management personnel and establishes the location and operating conditions of the Emergency Operations Center (EOC). As such, adopting and implementing the EOP is a critical first step in providing local emergency services measures in response to a natural hazard event.

Emergency services measures are implemented at the local, County, State, and/or Federal level, depending on the severity of the hazard event, and include the following actions:

- Hazard warning
- Hazard response
- Critical facilities protection
- Post-disaster recovery and mitigation

4.4.3 Property Protection

Property protection measures minimize an existing structure's vulnerability to a known hazard, rather than trying to modify or control the hazard itself. Property protection measures involve improvements to both public and privately owned property and must be coordinated (and often cost-shared) with the respective property owners. Some measures do not affect the appearance or use of the structure, which make them appropriate for historical sites or landmarks. Implementation of a property protection measure requires the purchase of a local building permit. As such, property protection measures include the following activities:

- Relocation/acquisition
- Elevation
- Floodproofing
- Insurance
- Brush/shrub removal
- Emergency response planning
- Windproofing

4.4.4 Structural Projects

Structural projects typically involve efforts to keep floodwater and other natural hazards from impacting specific areas or structures. They are required to be designed by engineers and managed or maintained by the owner. From a flood hazard mitigation standpoint, these projects are designed to control flows and water surface elevations and to reduce the overall impacts of flooding. In some cases, due to costs and possible environmental implications, some structural projects may not provide full protection to individual properties. However, such projects as bridge and culvert modification are designed to protect numerous people and properties. Structural projects may include but are not limited to the following type of hazard mitigation project.

- Dams/levees/floodwalls
- Bridge/culvert modifications
- Channel modifications/diversions
- Firebreaks
- Sinkhole abatement
- Emergency water source development
- Safe rooms and community shelters

4.4.5 Natural Resource Protection

Natural resource protection activities that are implemented as hazard mitigation measures can be multiple in scope, purpose, and outcome. The preservation and restoration of natural areas, environmentally sensitive resources, or the overall quality of locally significant features, play a significant role in reducing local and regional damages caused by natural hazard events. Natural resource protection activities are often implemented by park, recreation, or conservation agencies and organizations, but are not limited to these types of entities. Hernando County, as with all local governments, has the ability to develop and implement a natural resource protection program that will minimize the impacts of natural hazards while enhancing the local and regional environment. The Southwest Florida Water Management Agency has played a major role in the acquisition, preservation and restoration of the county's natural resources. Protection activities that can

minimize the potential impacts of natural hazards include the following:

- Open space preservation
- Wetland protection
- Identification and implementation of Best Management Practices (BMPs)
- Water resources management planning
- River/stream corridor restoration

4.4.6 Public Information

Providing the public with accurate and relevant information is a key component of a successful hazard mitigation program. Public information activities advise residents, business owners, and local officials about natural hazards and ways they can protect themselves, their property, and their constituents from these hazards. Public information activities are directed at the entire county to include not only the citizens and the business owners, but visitors also. These programs are developed to motivate people to take precautionary steps on a pre-disaster basis, and to develop awareness. Hernando County's public information activities include the following:

Map information

- Education and Outreach programs
- Environmental education

4.5 Evaluation of Mitigation Alternatives

The review and assessment of the status of hazard mitigation in Hernando County was completed by the Local Mitigation Strategy Working Group and other interested parties. Based on the most current information available, the LMS Working Group identified those mitigation actions that have been completed, partially completed or otherwise no longer met the priorities of the community.

4.5.1 General Hazard Mitigation Alternatives

The following local resources provide guidelines, tools and codes as well as a designated source for funding to promote and achieve mitigation activities, thereby reducing the effects of future disasters in Hernando County. These mitigation alternatives are general in nature and apply to all identified hazards.

- **Comprehensive Plans and Land Development Codes** have been adopted by Hernando County and the City of Brooksville. The Comprehensive Plans are developed over a long-range timeframe through land use and public infrastructure planning. Both the Comprehensive Plans and Land Development Codes regulate development by dividing the jurisdictions into zones or districts and establishing specific development criteria for each. As such, these development criteria include provisions for the area's known natural hazards. Vulnerable lands would be those associated with known hazards such as areas subject to flooding, dam failure, wildland fire and areas subject to land subsidence. Proper planning should include appropriate recommendations for the use of these known hazard areas, such as parks, greenways, wildlife refuges, and other open space uses protected from future development. Similarly, the Land Development Codes should include separate zones or districts with appropriate development criteria for these known hazard areas.

- **Land Development Codes**, including subdivision regulations, have been adopted by Hernando County and the incorporated cities. These codes regulate how land can be subdivided into individual lots and establish certain standards/criteria for the location and construction of buildings and associated infrastructure (i.e., roads, sidewalks, utility lines, stormwater management facilities, etc.). As such, Land Development Codes include jurisdiction-specific, hazard mitigation-related development criteria for the location and construction of buildings and other infrastructure in known hazard areas in an effort to avoid future damages and minimize existing problems. Examples of

some hazard mitigation-related development criteria include watershed-specific stormwater management regulations, land use specific erosion and sedimentation control requirements, hazard specific building and infrastructure location limitations, and a requirement to incorporate various pre-defined, jurisdiction-specific hazard mitigation/prevention measures into all development plans. Along these same lines, the mandatory use of conservation subdivision design principles may also be employed to minimize/mitigate the potential impacts of natural hazards. Conservation subdivision design principles involve clustering homes/development in a proposed subdivision to avoid known hazard areas (i.e., steep slopes, floodplains, etc.) and environmentally sensitive resources (i.e., wetlands, critical wildlife habitats, etc.), thereby developing the most appropriate land while permanently establishing a network of protected open spaces.

- **The Florida Building Code** regulates the construction, renovation, and alteration of new and existing structures by establishing minimum building standards and providing for routine inspections by a certified building code inspector. As such, the Florida Building Code includes specific standards for hazard-resistant construction. Examples of some hazard mitigation-related building standards include requiring the use of fireproof/resistant building materials, specifying particular construction practices to promote wind resistance, specifying the use of waterproof/resistant building materials and building elevation in known flood hazard areas, and requiring certain foundation and structure anchoring specifications in known floodwater velocity areas.

- **Geographic Information Systems (GIS)** applies computer technology to hazard mitigation planning by linking data to maps. Detailed property information, socioeconomic data, critical facilities inventoried, and hazard locations, among other relevant information, can be continuously updated to provide a complete assessment resource for mitigation planning and other planning studies. HAZUS-MH (Hazards U.S. Multi-Hazards) is the tool developed by FEMA to apply loss estimation models for Wind, Hurricanes, and Flooding within a GIS framework.

- **Capital Improvement Plans (CIP)** can recommend the allocation of funds for public acquisition of open space lands, capital expenditures for emergency service facilities, improvements to retrofit or relocate vulnerable critical facilities, and other capital improvements. The CIP is usually tied to a comprehensive plan and programs capital improvements over a five or six year period, with funding identified. The capital expenditure requirements of high priority projects within a hazard mitigation plan should be included in the CIP.

- **Emergency response planning** where in certain situations, implementation of physical property protection measures (i.e., relocation, elevation, or floodproofing) may not be technically or fiscally appropriate. This is most often the case for larger flood-prone business and industry buildings, where relocation is undesirable and retrofitting techniques may be too costly or not technically feasible. As such, alternatives to physical property protection measures must be explored. One alternative to implementing physical property protection measures is to develop an emergency response plan specific to the particular business or industry. An emergency response plan is a guidance document that identifies and describes specific emergency preparation and response procedures to be implemented on a pre- and post-disaster basis in order to minimize potential hazard impacts. As such, emergency response planning can serve to minimize potential impacts to both the structure and its contents/inventory. In this manner, emergency response planning for a particular business or industry would constitute a property protection measure.

- **Map information** provides many benefits by providing hazard information to inquirers. Residents and business owners who are aware of potential hazards can take steps to avoid future problems and/or reduce their exposure to flooding. Real estate agents and potential homebuyers can

determine if a particular property is located in a known flood hazard area and whether flood insurance may be required by their lender. It is important to remember, however, that flood maps are not perfect; the older maps display only the larger flood-prone areas that have been studied. Some maps are based on data that are more than 20 years old. The South West Florida Water Management District is a Cooperating Technical Partner with FEMA. They have completed the detailed study of our 20 watersheds, which have result in the production of our Digital Flood Insurance Rate Maps (DFIRM's)

- **Education and Outreach programs** to mitigate damages to existing structures several independent public outreach programs will be implemented in order to educate the public on mitigation options. The first is targeted specifically to properties immediately adjacent to the repetitive loss properties. This outreach will become part of the County's general Community Rating System outreach and will be performed annually in combination with the Repetitive Loss Property owner outreach program. The GIS mapping group, with assistance from the Emergency Management staff, developed a specific address/target list of properties based on the Repetitive Loss Properties list. General public outreach will be conducted at County events, including the Emergency Management Hurricane Expo and general presentations to community groups. Finally, increased outreach is planned specifically targeted to businesses and industry and, again, will focus on mitigation (of existing structures) or prevention (when developing new structures). Outreach projects can vary with the type of identified hazard and the audience you are trying to reach. Hernando County, as a participant in the Community Rating System, is required to provide outreach materials to our Repetitive Loss Areas. This outreach identifies the various techniques for flood mitigation as well as funding opportunities that may be of benefit to the owner(s).

- Hernando County maintains records regarding flood zones, elevation certificates, Letters of Map Amendment and insurance requirements. The Hernando County website also contains this information as well as detailed updates during severe weather or other hazard events.

- Other approaches can include the following:

    - Mass mailings or newsletters to all residents
    - Notices directed to floodplain residents
    - Displays in public buildings or shopping malls
    - Newspaper articles and special sections
    - Radio and TV news releases and interview shows
    - Presentations at meetings or relevant local organizations
    - Floodproofing open houses
    - Website notices with hyperlinks to other sources of information

- **Hazard warning** to include a comprehensive disaster warning system ties a variety of systems into a network to advise the public of emergency situations. This system includes the Code Red Emergency System, the sirens located along the west coast communities, which can use either voice activated or canned messages, the use of live broadcasts from the EOC as well as special public information messages on local television and radio stations.

  The earlier and more accurate the warning, the greater the number of people who can implement protective measures. Multiple or redundant systems are most effective: if people do not hear one warning, they may still get the message from another part of the system. Depending on the circumstances, additional means of warning the public are done through the use of:

- Alert Hernando
- NOAA weather radio
- Mobile public address systems
- Telephone trees
- Internet weather related sites
- Municipal/county/state Internet sites
- Door-to-door contact
- Reverse 911/ Code Red
- Integrated Public Alert and Warning System (IPAWS)
- Social Media

- **Post disaster recovery and mitigation activities** will be used during the rehabilitation/reconstruction of our communities. In general, these actions will ensure that we build back better and stronger as well as ensure that all temporary facilities and uses provide for the protection of our citizens. Hernando County, as with all coastal communities in Florida are required to prepare a Post-Disaster Redevelopment Plan which will identify policies, operational strategies, and the responsibilities for implementation of this plan for decisional making. Elements of the plan include, but are not limited to, repair and replacement of housing, the resumption of local business and economic redevelopment.

- Critical facility protection including protection from floods, high winds. Critical facilities should be hardened to reduce the risk of significant injury, interruption of critical services, and to maximize the structural integrity.

    - The following mitigation alternatives are specific in nature to hazards of high vulnerability: flooding (flash floods, hurricane flooding and dam failure), wind (hurricanes and other severe storms), and wildfires and aid in the reduction of said vulnerabilities.

4.5.2 Flood Hazard Mitigation Alternatives

- **Floodplain development regulations** In order to minimize vulnerability and future losses to buildings, infrastructure and critical facilities, due to floods, stringent building regulations are currently, and will continue to be, strictly enforced. The County's Floodplain Manager, who also serves as the Zoning Official, is charged with enforcing Chapter 13 of the Municipal Code of Ordinances and the amendment, specifically Ordinance No. 86-7, adopted April 22, 1986, which focus on Flood Damage Prevention and Protection. Two critical items to highlight from the Code is the ability of the Zoning official to enforce the use of "best available data" and the substantial improvement rule. Currently, Hernando County, in partnership with FEMA and the Southwest Florida Water Management District, has prepared the new Digital Flood Insurance Rate Map (D-FIRM). With the completion of the study phase of the 20 watersheds, preliminary maps were prepared ahead of the LIDAR data being ready. Although incomplete, the maps were considered more accurate than the 1984 predecessor and are therefore "best available data". At his discretion, the Zoning official, through the Code, is able to use this data to guide construction requirements lot by lot in order to meet the future flood zone requirements. Similarly, the municipal permitting department within the City of Brooksville has the authority to enforce building code for future development that supports mitigation efforts. Inarguably, this is in the best interest of both the County and the property owner in the long term. This process came to conclusion in 2012 and the County has adopted these new maps by resolution, effective 2-2-2012.
- **Stormwater management** involves the effective management of stormwater runoff from developed areas and can go a long way in minimizing local and regional drainage problems and associated flooding hazards. In addition, stormwater management practices that promote infiltration work towards the minimization of drought impacts by contributing to the base flow of local streams and

watercourses. Stormwater management regulations, which are incorporated into the land development ordinances of Hernando County and the incorporated cities, require developers to construct on-site stormwater management facilities that will effectively collect, convey, and store surface water runoff.

In addition, the Department of Public Works has identified and is working on several drainage retention areas (DRA) improvements to help mitigate flood damages. Case in point: The Stoney Brook DRA was insufficient in size and was frequently wet even during dry season. With additional nearby development underway the problem was compounded. The County recently installed a pump and ran a pipe to a nearby larger DRA on a golf course where the water is recycled onto the greens. Over 100 homes were protected through this project which was wholly funded with local monies. South Brooksville has also benefited from three floodplain mitigation projects increasing storage and controlling velocity of floodwater flowing to the community, BMP 5,6 & 7 from Bystre Lake Watershed Flood Study).

- **Detailed plans and targeted studies** for areas of special consideration were reviewed. The County is partnering with the Southwest Florida Water Management District through their Cooperative Funding Initiative grant program to complete the detailed studies of our watersheds, which will result in the production of our DFIRM's.
- **Community Rating System (CRS) Program** crosses all six mitigation program elements. The CRS rewards communities for conducting a full range of flood mitigation programs that exceed the minimum NFIP requirements by awarding points to achieve a rating classification. Total points determine the class of a community. A high class means more savings to flood insurance holders and more recognition to the successes of the local floodplain management program. Hernando County is currently a Class 5 Community, which provides our citizens with a 25% premium discount on flood insurance policies for structures located in the A and V flood zones.
- **Relocation** or moving a building to higher ground is a sure way to minimize potential flooding impacts. Portions of the county have areas subject to flash flooding, high velocity flows, deep water, or where the only safe approach is to remove the building, should consider relocation out of the floodplain and/or acquisition. Removing buildings from the floodplain is not only the most effective flood protection measure available, it is also a way to convert a problem area into a community asset and obtain environmental benefits. Relocation is preferred for large lots that include buildable areas outside the floodplain or where the owner already has a new flood-free lot available. Relocation can be expensive, however. While almost any building can be moved, the cost goes up for heavier structures, such as those with exterior brick and stone walls, and for large or irregularly shaped buildings. There are also a number of factors that affect the feasibility of relocation such as road width and grade, density of overhead utilities, and other related factors.
- **Acquisition** of buildings in a flood-prone area ensures that they will no longer be subject to damage. The major difference is that acquisition is undertaken by a government agency so the cost is not borne by the property owner, and the land is converted to a public use, such as a park. Acquisition, followed by demolition, is most appropriate for buildings that are difficult to move, such as larger, slab-on-grade foundation or masonry structures, and dilapidated structures that are not worth protecting. Benefit-cost should be assessed and other, less costly alternatives might also be investigated.
- **Elevation** of a flood-prone building above the base flood elevation is often the best on-site protection strategy. In Flood Zone 'A' or 'V', the building could be raised to allow water to run underneath it. Alternatively, in Flood Zone 'A' but not in Flood Zone 'V', it may be possible to use fill to elevate the site on which the building sits. This approach is much less expensive than relocation or acquisition, and tends to be less disruptive to a neighborhood. However, this is not a suitable solution within the Coastal areas. Elevation is required by local floodplain regulations, as well as by the Florida Building Code, for new and substantially improved buildings in a floodplain, and is commonly

practiced in flood hazard areas nationwide.

- **NFIP flood insurance** has the advantage that, as long as the policy is in force, the property is covered and no human intervention is needed for the measure to work. Although most homeowners' insurance policies do not cover a property for flood damage, any owners can insure a building through the NFIP. A municipality must participate in the NFIP in order to make flood insurance available to its residents. The county and the City of Brooksville participate in this program. Flood insurance may also be advisable for properties located in dam inundation areas and areas outside of regulated floodplains where flood damage may still occur due to drainage problems and/or heavy rain events. All FDIC insured lenders are required to protect their investment by requiring the purchase of flood insurance for those properties located in Special Flood Hazard Areas. With this participation, continued compliance is ensured. Additional incentive comes when a greater score is earned for the CRS program with the NFIP participation. Also, in order to maintain NFIP compliance, The current Flood Insurance Rate Maps have an effective date of February 2, 2012. The new maps reflect findings of the studies performed by FEMA and the Southwest Florida Water Management District. They incorporate information from the study of 22 watersheds. Hernando County and the City of Brooksville will continue activities related to:
    - Management of all development for properties located in the Special Flood Hazard Area
    - The coordination of Community Rating System activities that result in the reduction of flood insurance premiums within the County
    - The official community repository for all flood maps and Letters of Map Amendments
    - General assistance to the public, lenders, insurers and other professionals in obtaining copies of pertinent documents and flood zone research property specific
    - Coordination with local, State and FEMA business partners
    - Maintain elevation certificates on file for all new construction in the SFHAS or for substantial improvements to properties in the SFHA
    - Updated mapping provided to each municipality
    - Maintain records pertaining to LOMAS, and LOMRS, etc.
    - Continue to promote flood insurance to property owners.
    - Promote hazard flood mitigation to the public.
    - Continue drainage maintenance and drainage system improvement projects.
    - Encourage more drainage projects through-out the county in all LMS meetings
- **Dams, levees and floodwalls** are similar in that they control flooding by restricting floodwaters from reaching/inundating protected areas. Dams, levees and floodwalls are probably the best-known forms of structural flood control projects that have been implemented in the United States. It is important to note, however, that just like any other engineering feature, if the design capacity of a dam, levee and/or floodwall is exceeded; its functional utility becomes compromised. As such, dams, levees and floodwalls can give a false sense of security to the property owners that they protect.
- **Bridge/culvert modifications,** if undersized, at crossings of local streams and watercourses can result in floodwater backing up upstream of the structure causing significant flooding problems. Therefore, from a flood hazard mitigation standpoint, bridge/culvert modifications typically involve the replacement, enlargement, and/or removal of existing roadway bridges and culverts that are known to cause flooding problems. Replacing, enlarging, or removing these known problematic structures goes a long way in minimizing the County's flooding problems.
- **Open space preservation** is keeping known hazard areas free of development and in a natural condition, and is the best approach to minimizing or preventing potential flood damages. Preserving open space in an undeveloped floodplain not only prevents potential flood damage but also allows for the full realization of the floodplain's natural and beneficial functions. These natural and beneficial floodplain functions include floodwater storage/flood flow attenuation, surface water

infiltration/groundwater recharge, removal/ filtering of pollutants and sediments from floodwater, habitat for flora and fauna, and recreational opportunities. Open space preservation is regulated by the adopted Comprehensive Plans and Land Development Codes.

- **Wetland protection** is needed in floodplains and low lying areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flows. They also serve as a natural filter, which helps to improve water quality and provide habitat for many species of fish, wildlife, and plants. As such, local wetland protection codes and programs are developed to address these gaps in the federal and state regulations.
- **River/stream corridor restoration and protection** are measures to help restore the natural and beneficial functions of riparian zones to manage floods and filter runoff.
- **Best Management Practices (BMPs)** are measures that reduce the volume of surface water runoff and associated non-point source pollutants from entering waterways. Non-point source pollutants are transported by surface water runoff and include lawn fertilizers, pesticides, farm chemicals, sediments, and oils from both pervious and impervious urban and rural areas. Non-point source pollutants not only affect the quality of our local water resources but also their ability to carry and store floodwaters. Eroded soil from farmlands and construction sites is typically deposited where streams and rivers slow down and lose energy, such as when they enter a lake or confluence with another stream. As such, sedimentation will gradually fill in channels and lakes, reducing their ability to carry or store floodwaters. In addition, uncontrolled surface water runoff contributes to local and regional flooding problems. From a hazard mitigation perspective, the identification and implementation of BMPs is focused on structural and non-structural erosion and sedimentation control and stormwater management facilities. Many BMP measures (structural and/or nonstructural) can be implemented on a site to address specific site needs. Both erosion and sedimentation control and stormwater management BMPs can be incorporated into retention and detention basins, drainageways, and many other parts of new developments. Depending on local ordinances, specific BMPs and structural measures are already required on industrial sites, mined lands, construction sites, farms, forested areas, and high-use public lands.

  Other BMP guidelines are included in engineering and construction standards designed to ensure that structures are able to withstand various hazards such as erosion in Coastal areas.

4.5.3 Wind Mitigation Alternatives

Proper engineering and design of a structure increases its ability to withstand the lateral and uplift forces of wind. Building techniques that provide a continuous load path from the roof of the structure to the foundation are generally recommended.

The following are wind mitigation alternatives reviewed by the LMS Working Group.

- **Wind proofing** is the modification of the design and construction of a building to resist damages from wind events and can help to protect the building's occupants from broken glass and debris. Wind proofing involves the consideration of aerodynamics, materials, and the use of external features such as storm shutters. These design considerations are required in the design and construction of a new structure and recommended to reinforce an existing structure. Mobile homes, which tend to be vulnerable to the effects of extreme wind events, can be better protected by improved anchoring to the foundation. Mobile homes are required by the Florida Building Code to be tied down to their pads in order to prevent them from being destroyed. Public facilities, critical infrastructure, and public infrastructure (such as signage and traffic signals) are required by the Florida Building Code to be windproofed in vulnerable areas. However, wind proofing is not a viable mitigation technique to protect against tornadoes or extreme hurricanes.
- **Safe room/community shelter requirements** for new housing construction and existing mobile home parks, apartment complexes, and other planned residential communities can offer protection and

reduce the risk to life. There are minimum design criteria to which these elements must be constructed as found in ARC 4496 and FEMA 320 Taking Shelter From The Storm.

- **Buried power lines** can offer uninterrupted power during and after severe wind events and storms. Burying power lines can significantly enhance a community's ability to recover in the aftermath of a disaster; however, they are more expensive to install and repair if there were a problem and may be more vulnerable to flooding in some locations. Encouraging back-up power sources in areas where burial is not feasible will enable the continuity of basic operations for businesses and facilities when there is a loss of power.

4.5.4 Fire Mitigation Alternatives

Following are mitigation alternatives to reduce the vulnerability from wildfires reviewed by the LMS Working Group.

- **Urban forestry program** where a number of cities nationwide have participated in formal programs to protect and maintain urban forests, is especially helpful for the mitigation of wildfires.
- Firebreaks have been used by the State to limit the mobility of potential wildfires. Construction of a firebreak involves removing vegetation in a linear strip to significantly diminish the available fuel load. There may be locations in the County where construction of a firebreak may prove to be a feasible and prudent wildfire hazard mitigation measure, in particular areas where there is rural development adjacent to forested areas or limited access. This type of development scenario is particularly susceptible to wildfire hazards.
- **Emergency water source development** is used to increase public water supply systems and the associated curbside hydrants for local firefighting needs. One solution for access to reliable water sources and the ability to efficiently pump water from those sources is the installation of dry hydrants at various bridges and culvert crossings of local streams and watercourses. Another solution would be the development of community well sites.
- **Prescription Burning.** The use of planned wildland fuels burning programs has been used by the state and Federal land management agencies as the best proven method to reduce hazardous wildland fuel accumulations. This process is routinely accomplished in coordination with the establishment of firebreaks and is conducted on state, federal and private lands where the accumulation of wildland fuels can pose a threat to neighboring communities. These are carefully planned operations that must meet specific weather conditions and are thoroughly coordinated with county or jurisdictional fire agencies.
- **Chopping and Mowing/ Vegetation Reduction.** Mitigation of the fuel component is one of the most efficient ways to reduce the risks of wildfire occurrence. Vegetation-fuel management through such things as tree and vegetation thinning or reducing the amount of herbaceous vegetation decreases the chances of fire propagation across the landscape by breaking up the horizontal and vertical continuity of fuel. This reduces Fireline intensity, significantly lowers the risk of structure loss, and creates a safer situation in which to deploy suppression resources.

4.5.5 Sinkhole Mitigation Alternatives

Sinkhole abatement is the physical treatment of new and existing sinkholes in an effort to minimize potential damage to buildings, infrastructure and other surface features. Sinkhole treatment is usually a matter of abatement after the fact rather than prior mitigation. Sinkhole abatement involves filling the surface feature with a mixture of materials including concrete, soil, grout, synthetic filter fabrics, and various sizes of crushed stone. Since no two sinkholes are alike, abatement can vary significantly in the type and volume of materials that are used. Regardless of the size and nature of the sinkhole, however, certain precautions should be taken when dealing with structural sinkhole abatement. These precautions, which are designed to reduce safety concerns and mitigate potential environmental impacts, include barricading the site to prevent personal injury, excavating the overlying soil to determine the appropriate abatement method and to expose a competent limestone ledge, and directing surface drainage away from the site to prevent a reoccurrence.

4.5.6 Severe Storm Mitigation

Actions to mitigate damages from severe storms and tornados have been primarily focused on educational and situational awareness campaigns as well as wind retrofit projects in the government sector. In addition, strict enforcement of the building code will help to mitigate damages in the future housing stock from severe storms.

Injuries and fatalities during a thunderstorm often result from people underestimating risks and not seeking appropriate shelter quickly enough in response to an approaching storm. Educational outreach addressing the dangers of lightning is an aspect of mitigation. Weather radios should be monitored for alerts or warnings, and organizations should install warning systems to alert people to the impending threat of lightning. Although not listed specifically as a mitigation project, Hernando County purchased and distributed several hundred weather radios as part of its weather awareness campaign. A percentage of the radios were specifically for the hearing impaired.

4.5.7 Drought and Heat Wave Mitigation

Hernando County, as well as much of Florida, has experienced drought during the last three years. Local public education efforts by the County Utilities Department concerning conservation met with some success and were supported by the stringent watering schedules imposed by the Southwest Florida Water Management District. While there is little we can do today to create rain, there is much we can do to preserve existing resources and protect the aquifer.

4.5.8 Winter Storms/Freezes

Freezes and other cold weather events generally occur in Hernando County between the months of November and February each year. Public education outreach will provide information to homeowners and agricultural landowners to help them plan ahead and prepare for cold weather in order to protect themselves, sensitive crops and livestock. This public outreach campaign is led by Hernando County Extension Services, a division of IFAS.

4.5.9 Hazardous Materials

Mitigation of Hazardous Materials incidents includes techniques to reduce losses to emergency personnel, citizens, structures and the environment. These techniques include extensive training to personnel as well as notification and education of the public. The county participates in the regional Local Emergency Planning Committee (LEPC) which works together with other local governments, the private sector, and citizens to identify preplanning for facilities, mitigation measures, projects and ensure the public's right to know under SARA Title III. There are no timeframes associated with this mitigation effort as it is constant and ongoing.

4.6 Evaluation and Prioritization of Mitigation Alternatives

As described in Section 1.2.4, Approximately 80% of the population is in the urbanized area of Spring Hill/Brooksville. Regionalization pressures and increasing population will continue to increase the county's vulnerability to natural and manmade hazards. The current residential population center, Spring Hill is aging and becoming more diverse. Transportation infrastructure will change with expanded regional access via State Road 50 and the Suncoast Parkway. As such, Hernando County will have to assess the vulnerability of new residents and buildings as well as that of those traveling into or through the county during an evacuation event.

According to Property Appraiser data 3,063 parcels have added new buildings since 2015. Of these parcels, 2,234 were developed as single-family residential and 611 of those are in the 100-year floodplain. Most of the housing units are located near major roadways and there is a concentration of development along the southern border of the county including areas around Hunter's Lake and Masaryktown. Single-family housing is especially vulnerable to storm damage during a tropical cyclone event, sinkholes, severe storms, and wildfire regardless of where the housing is in the county. Properties in identified flood zones and storm surge areas are additionally susceptible to flooding. Additionally, new roadways leading into new subdivisions are susceptible to damage and obstruction caused by these natural hazards. No significant additions to critical infrastructure occurred since 2015. Since 2015 new commercial development occurred along Cortez Blvd, Spring Hill Drive and Mariner Blvd. These increasing vulnerabilities were factored into an update of the project ranking system.

The 2015 update of the local mitigation strategy used the STAPLEE formula to rank projects. With the 2020 update, the LMS Work Group developed ranking criteria that more closely aligns with new and existing goals. The new ranking system places a higher emphasis on mitigating repetitive losses and hardening critical facilities which better aligns with Goal 2 – Create a Disaster Resilient Community. All properly submitted projects are prioritized by the working group using the Project Evaluation Elements (Table 4-1). For the purposes of the overall project ranking for the LMS Action Plan, cost-benefit is defined as the ratio of the dollar amount to the number of people served. Based on the final points awarded, each project was then given a priority of low, medium or high. Based on these findings the group then held a discussion to assign a priority number to each project.

In addition to assigning an overall priority number for the LMS Action Plan, a separate prioritization and rank will now be conducted per funding source as each funding source has its own set of priorities. Currently, the Project Evaluation Elements are intended to be broad enough so that each project can comply with the funding sources provided.

Where there was a "tie", two or more projects with equal ranking, the members of the working group were asked to decide which element had the most value in the county. Where possible, they were asked to vote on projects in an effort to break a tie.

At the conclusion, members were asked to concur and approve the final prioritization for mitigation projects and programs. Ranking will now occur per funding source due to different criteria per grant requirements.

Table 4-1 – Project Evaluation Elements

Project Rank	Benefit	Cost	BCR	RL/SRL Mitigated	LMS Goal Met	Structure Removed from SFHA	Funding Source	Critical Asset	CRS Enhancement	NFIP Property	Total Score
#	Value in todays dollars	Actual cost in todays dollars	Benefit Cost Ratio	5 - RL 2 - potential RL 0 - not a RL	3 - meets 3 LMS Goals 2 - meets 2 1 - meets 1 0 - does not meet LMS Goals	Points equal number of structures removed from the SFHA	3 - outside funding available, >50% 2 - outside funding available @ > 25% 1 - outside funding available @ < 25%; 0 – no outside funding	5 - facility is critical 3 - moderately Critical 0 - not critical	5 - project significantly enhances County's CRS score 3 - moderately Enhances CRS 0 – does not enhance CRS	1 - property protected by NFIP Insurance 0 – no NFIP insurance	#

4.7 Action Plan

The mitigation action plan (Table 4-2) is a listing of all the mitigation action items for Hernando County, and the City of Brooksville. The action items are organized within the following matrix, which lists all of the multi-hazard and hazard specific action items included in the mitigation plan. The Action Plan includes documentation of how each mitigation measure will be implemented, including the following information for each action item:

- Property Owner
- Hazard Ranking
- Jurisdiction
- Amount Requested/Funding Sources,
- Timeframe, and
- Project Status

The action plan was updated to reflect changes in development, progress in local mitigation efforts and changes in priorities. New development was factored into the updated action plan in several ways. As part of the vulnerability analysis the newest available property appraiser data was used to determine the number of buildings and properties at risk for each hazard. Progress on local mitigation efforts is reflected in the updated action plan. Several projects have been removed from the list, as the jurisdictions has focused increasingly on acquisition, hardening and infrastructure projects. The plan has been revised to reflect changes in priorities since the plan was previously approved by amending the priority ranking to more closely reflect the community's priorities. The community has added projects that align with newly added goals related to wildfire mitigation and disaster resilience. Table 4-3 lists the complete mitigation projects for the county.

4.7.1 Funding Sources

Potential funding sources have been identified for the mitigation actions. Many of the mitigation actions are eligible for funding from more than one source of funding. In these cases, a list of potential funding sources was included on the matrix. Most federal funding sources, such as FEMA will require a percentage (usually 25 percent of the total project costs) from a local source.

4.7.2 Time Frame

Action items include both short and long-term activities. Each action item includes an estimate of the timeline for implementation. Short-term action items are activities which county agencies are capable of implementing with existing resources and authorities within one to two years. Long-term action items may require new or additional resources or authorities, and may take between one and five years to implement. Approximate timeframes for project implementation have been included in the Action Plan.

4.7.3 Responsible Agency

The responsible or lead agency is the public agency with regulatory responsibility to address natural hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring, and evaluation. Responsible agencies may include local, county, or regional agencies that are capable of or responsible for implementing activities and programs.

4.7.4 Project Status

A column has been included in the Action Plan to document the project status. A number of the mitigation actions have been completed, while others have been started, but not completed to date. The Action Plan may include details on funding that has been applied for or received; "on-going" for projects that are continuous such as educational programs; "in process" for projects that are currently being implemented; "completed" for projects that have been finished; or "dropped" for projects that are no longer applicable.

Ranking	LMS Priority	Owner	Hazard	Funding Source(s)	Action/Description of Project	Responsible Agency	Estimated Project Cost	Timetable	Current Status
Ranked / Prioritized Projects									
1	High	Hernando County Waterways Facility	Flood		Demo/rebuild	HC Public Works	$5,000,000	3-4 years	
2	High	City of Brooksville Wastewater Surge Tank	Flood		Install surge tank (350,000 gallons) to ensure consistent flow and capacity	City of Brooksville Utilities	$400,000	3-4 years	
3	Low	Masaryktown Community Center	All Hazards		30KW-40KW 3 phase Generator - Lincoln Avenue	HC Emergency Management	$20,000	3-4 years	
4	High	The Arc Nature Coast	Hurricanes		Developmental disabilities Regional Shelter Expansion	The Arc Nature Coast	$400,000	3 Years	
5	High	The Arc Nature Coast	Hurricanes	Local	Developmental disabilities Regional Shelter Equipment	The Arc Nature Coast	$16,000	2 Years	
6	High	HC BOCC	Hurricanes	HMGP, Local	Construct hardened EOC and 911 Operations Center.	HC Emergency Management	$1,187,211	5 Years	
7	Medium	Lifesouth Blood Center	Hurricanes	Local, other	Critical equipment alarm system	Lifesouth Community Blood Centers	$150,000	2 Years	
8	Medium	Lifesouth Blood Center	Hurricanes	Local, other	Redundant generator system	Lifesouth Community Blood Centers	$150,000	3-4 years	
9	Low	The Arc Nature Coast	Hurricanes	HMGP, (PDM)	Developmental disabilities Regional Shelter Storage Facility	The Arc Nature Coast	$250,000	2 Years	
10	Low	Lifesouth Blood Center	Hurricanes	Local, other	Demolition/Rebuild 2nd story of existing critical facility	Lifesouth Community Blood Centers	$1,500,000	2 Years	
Approved Projects									
	Low	HCSO	All Hazards	Local	All Hazards Outreach: National Night Out Expo	HC Sheriff's Office	$10,000	Annual	
	Low	HC BOCC	Flood	Local	Annual CRS Outreach – All Property Owners	HC Sheriff's Office	$4,000	Annual	
	Medium	HC Fire Rescue	Hazardous Materials	Local	Local training for employees to support mitigation and response activities	HC Sheriff's Office	$unknown	Annual	
	Low	Hernando County	Sinkholes	Local	Sinkholes / Informational Handbook for Countywide distribution	HC Emergency Management	$unknown	2 Years	
	Medium	HC BOCC	Flood	Local	Improvements to areas for stormwater management – Countywide	HC Public Works	$2,500,000	5 Years	
	Low	HC BOCC	Flood	Local	Improve Star Road from limerock status to two-lane collector road intersecting to Weeping Willow then ultimately to Exile Road	HC Public Works	$4,000,000	3 Years	
	Medium	HC BOCC	Hurricanes	Local	Construct critical infrastructure at Brooksville Fire Dept Station	HC Public Works	$572,000	2 Years	
	Low	HC BOCC	Hurricane	Local	Purchase land for future construction of new fire station #18	HC Public Works	$50,000	2 Years	
	Medium	HC Public Works	Flood	HMGP	Pine Island Seawall	HC Public Works	$2,000,000.00		
	Medium	HC Public Works	Flood	HMGP	US 98 & Hannibal	HC Public Works	$1,000,000		

	Low	HC Public Works	Flood	HMGP	Pine Island Drive Elevation	HC Public Works	$2,250,00.00		
	High	HC EM	All Hazards	HMGP	Challanger Generator	HC EM	$4,900,000		
	Low	HC BOCC	Hurricanes	Local	Purchase land for future construction of new fire station #29	HC Administration	$50,000	2 Years	
Potential Projects Not Yet Approved									
	Medium	HC BOCC	Flood	HMGP	Install generator & transfer switch: Springwood Rd lift station	HC Emergency Management	$34,000	1 Year	
	Medium	HC BOCC	Flood	HMGP	Install gen, auto transfer switch at Corrine Ave lift station.	HC Emergency Management	$34,000	1 Year	
	Medium	Brookridge Community POA	Hurricanes	HMGP, HLMP	Tie downs for structures in mobile home park	Brookridge Community POA	$4,950,000	2 Years	
	Low	HC BOCC	Flood	FMA, HMGP, CDBG, (PDM)	Elevation or Acquisition	HC Emergency Management	$unknown	4 Years	
	Low	HC BOCC	Safe Room	HMGP	Garage Safe Room Acquisition/Demolition of Repetitive flood loss house	HC Emergency Management	$unknown	2 Years	
	Low	HC Utilities	Hurricane, Severe Storm, Wind		Install 16 Generators at Hernando County Utilities Department	HC Utilities	$1,000,000	5 years	
	Low	HC Utilities	Hurricane, Severe Storm, Wind		Install 2 Generators at Landfill	HC Utilities	$72,000	1 Year	
	Low	HC BOCC	Hurricanes	HMGP, HLMP	Highpoint Mobile Home Park: Tie downs for structures in mobile home park. 1500 Homes	HC Emergency Management	$unknown	2 Years	
	Low	HC BOCC	Hurricanes	HMGP, HLMP	Cloverleaf Moble Home Park: Tie downs for structures in mobile home park. 900 Homes	HC Emergency Management	$unknown	2 Years	
	Low	HC BOCC	Flood	HMGP, CDBG	Acquisition/Demolition Marchmont Circle	HC Emergency Management	$52,870.34	>15	
	Low	Withlacoochee River Electric	Hurricane	HMGP	Hwy 19	Withlacoochee River Electric			Added 1/2025
	Low	Withlacoochee River Electric	Hurricane	HMGP	Shoal Line, Cortez, and Osaway	Withlacoochee River Electric			Added 1/2025
	Low	Hernando County School Board	Hurricane	HMGP, HLMP	Eastside Elementary Retrofit	HCSB			Added 2/2025
	Low	Hernando County School Board	Hurricane	HMGP	Eastside Elementary Generator	HCSB			Added 2/2025
	Low	Withlacoochee River Electric	Hurricane	HMGP	Pine Grove Elem., West Hernando Middle, and Central High Buried Transmission Lines	Withlacoochee River Electric			Added 2/2025
Submitted, Funded or Underway									
Former 5	Medium	Mr. Larry Fields	Flood	HMGP	Demo/rebuild	HC Emergency Management	$334,582	In progress	4337-148-R Pending Final Financial Closeout
Former 7	Medium	Mr. David Snutes	Wind	HMGP	Elevation/Wind retrofit of doors, windows and roof	HC Emergency Management	$328,464	In progress	4337-074-R Final Site Inspection set for 07-31-25
	High	Florida Fire Service SWFWMD	Wildfire		Richloam Tract & Green Swamp off of State Road 471	Florida Fire Service	$10,000	In progress	

	High	HC Fire Rescue & Florida Fire Service	Wildfire		Assessment of Communities at Risk (CAR) by the Florida Fire Service and Citrus County Fire	Florida Fire Service	$100,000	2-5 years	
	High	Withlacoochee River Electric	Wind	HMGP	Shoal Line Transmission Improvement	Withlacoochee River Electric	$2,026,322	2-5 years	4734-099-R (288) FDEM Review
	High	Diane Neste and Jeff Stantz	Flood	HMGP	Elevation	HCEM	$552,161	2-5 years	4734-052-R (229)
Former 1	High	HC Public Works	Flood	HMGP	Hunters Lake Outfall operable Structure	HC Public Works	$1,199,950	3-5 Years	Submitted to FDEM, no State or FEMA number
Former 2	High	HC Public Works	Flood	HMGP	Culbreath Rd & Carr Creek roadway elevation	HC Public Works	$2,287,500	3-4 years	4673-209-R
	High	HC Public Works	Flood	HMGP	Clipper Ct stormwater conveyance improvements	HC Public Works	$325,000		4673-074-R
	High	HC Public Works	Flood	HMGP	Old Crystal River Rd stormwater conveyance improvements	HC Public Works	$325,000		4673-320-R
Former 1	High	HC Fire Rescue	Hurricane	HMGP	Install generators with transfer switches, fuel tank with accessories to several fire stations	HC Fire	$750,000	3-4 years	Endorsed and submitted under HMGP Helene (Rank 1)
Former 1	High	Withlacoochee River Electric	Hurricane	HMGP	Hernando Beach Pole Hardening	Withlacoochee River Electric	1,410,000	3-4 years	Endorsed and submitted under HMGP Milton (Rank 1)
Former 2	High	HC Public Works	Flood	HMGP	Long Lake Outfall	HC Public Works	$1,750,000	3-4 years	Endorsed and submitted under HMGP Milton (Rank 2)
Former 3	High	Withlacoochee River Electric	Hurricane	HMGP	Cortez Blvd and Westwind Street Pole Hardening	Withlacoochee River Electric	1,470,000	3-4 years	Endorsed and submitted under HMGP Milton (Rank 3)
Former 5	High	HC Fire Rescue	Hurricanes	HMGP, HLMP	Reinforce bay doors and install Storm Shutters at several fire stations (Wind Retrofit)	HC Fire	$1,500,000.00	3-4 years	Endorsed and submitted under HMGP Helene (Rank 2)
Former 6	High	Fire Rescue	All Hazards	HMGP	Portable Generator Station #6	Fire Rescue	$100,000	2-3 years	Endorsed and submitted under HMGP Helene (Rank 3)
Former 7	Low	HC BOCC - Econmic Dev / Airport	Hurricanes	HMGP	Airport Generator	HC BOCC	$123,774	3 years	Endorsed and submitted under HMGP Helene (Rank 4)
	High	HC Fire Rescue	Wildfire		Conduct prescribed burns, roller chopping, and mowing to mitigate wildfires	Florida Fire Services	$6.3 M	Annual	
Completed Projects									
11	High	Hernando County Building Division	All Hazards	HMGP	125KW Generator	HC Emergency Management	$306,800	Complete	789 Providence Blvd.
2	High	Richard Gray & Karen Robinson	Flood	HMGP	Acquisition and demo of his residence	HC Emergency Management	$80,000	Complete	4337-030-R

5.0 Plan Evaluation and Maintenance

5.1 Overview

This section documents Hernando County's road map for maintaining the LMS and instituting the long-term plan maintenance procedures into the everyday workings of the County government. A continuous cycle for monitoring, evaluating, and updating the plan; incorporating mitigation strategies into other, ongoing planning activities; methods for continued public involvement; and the continuation of the LMS Working Group are discussed below.

5.2 Monitoring, Evaluating, and Updating the LMS

This plan will be monitored, evaluated and updated as needed to meet the changing needs of the community. The development of the 2025 LMS was the responsibility of the LMS Planning Committee, formed for the purpose of completing the five-year update. Hernando County Emergency Management Director, Erin Thomas is responsible for convening the LMS Planning Committee and the monitoring, evaluation and updates of the LMS Plan. To do so, the Local Mitigation Strategy Working group will convene "in the sunshine" to review and revise as necessary under the following circumstances: a) annually in the month of January or, b) when actual events substantially alter or negate parts of the Strategy or, c) at the request of a member of the Local Mitigation Strategy Working group; or
d) at the request of a municipality or the local government. All meetings will be preceded by one or all of the following forms of invitation to the working group members, neighboring counties, municipalities, private and public non-profits, businesses, general public and any other interested parties: email, press release, classified advertisement in the local newspaper, posting on the County and Sheriff's Office website.

In addition, annually, Emergency Management will solicit input from all LMS Working Group members in order to prepare a progress report that accurately reflects the status of the committee and its projects. The progress report will be presented to the Board of County Commissioners at a regularly scheduled board meeting and will be posted on the Emergency Management website. At a minimum, the following items will be reviewed to assess the status of the plan.

- Relevance/Applicability – Does the plan continue to be relevant to the community's goals?
- Usefulness/Benefits/Value – Does the plan continue to be useful, provide benefits to the community and continue to have value to the residents of Hernando County?
- Progress – Is progress being made towards completion of plan goals and mitigation projects?
- Participation – Is there sufficient community involvement in the LMS process or does outreach need to be conducted?

The schedule for the annual update will be as follows:

June Solicit input for update. Review plan, criteria and received input, prepare draft.
July Public meeting on draft report, modify report as appropriate
August Finalize report, submit for review to LMS Working Group and public
September 1st Post progress report on website; submit to the Board of County Commissioners
January Submit annual report to The Division of Emergency Management F.A.C. 9G 22.0004 (last working day)

The LMS Working Group also evaluated mitigation actions to see if they need to be modified or discontinued in light of new developments, including changes in laws or regulations from Federal, State, or local agencies; the addition of new funding sources; newly identified hazards or areas of vulnerability; changes in the

Comprehensive Plan, demographic, or land use trends; or results from previous hazard events. The LMS Working Group documents progress annually and submits the required annual update information to the Division of Emergency Management in accordance with F.A.C. 27P-22.004.

The LMS is to be updated every 5 years, as required by the DMA 2000, or following a disaster. The updated LMS would account for any information, programs, map revisions, changes to the repetitive loss statistics, etc. in the County or special circumstances (post-disaster). Issues that come up during monitoring and evaluation, which require changes in mitigation strategies and actions, will be incorporated in the LMS at this stage. Barring any disasters, it is imperative that the Plan, in its entirety be updated to meet the mandatory 5-year review and update.

The schedule for the next 5-year update will be as follows:

Time from Due Date:	Action:
T - 18 months	First public meeting and formation of committee, begin data collection and research for the risk analysis
T - 12 months to 9 months	Public Meetings, task assignments, plan updates, complete draft
T – 8 months to 6 months	Final Public Meeting, Plan Approval by LMS Committee, Submit Plan to State of Florida for review
T - 9 months to 6 months	Make revisions if necessary
T – 6 months to 3 months	Submit to FEMA for review target due date Receive FEMA approval
T + 2 months	Board of County Commissioners and Municipalities for adoption process

The plan will be reviewed by Emergency Management in partnership with the following: the County's Zoning, Planning, Engineering, the City of Brooksville, the LMS Working group, and the general public. This process will require members to provide detailed information concerning their projects, ordinances, progress and programs. Emergency Management will compile the information which will be presented to the entire Local Mitigation Strategy Committee and the public at several publicly noticed meetings for comment and approval. The review will be accomplished by public notices and on-going mitigation plan committee meetings.

Public participation will be essential to producing a quality program for the County and the municipalities to implement. It is anticipated that notices will be placed in newspapers, public meeting places, libraries and County and City websites to encourage participation in the process. It is also the intent of the members to personally encourage participation through public speaking engagements.

Upon final approval of the plan by the State of Florida and the Federal Emergency Management Agency, the Local Mitigation Strategy will be presented to the Hernando County Board of County Commissioners, the City of Brooksville, the City of Weeki Wachee and the Local Mitigation Strategy Committee for adoption and/or incorporation into existing plans as appropriate. The plan will also be made available to the public on the County's website.

5.3 Implementation through Existing and Ongoing Programs

The County's Local Mitigation Strategy is incorporated into existing planning mechanisms as follows:

The Permitting section of the Building department enforces the Building Code Ordinance. The Code has specific criteria related to both wind and flood mitigation. At the point of permitting, enforcement of the Code supports the mitigation strategy.

The Zoning Official manages the Floodplain Management Plan. The FMP is a broad planning document that focuses specifically on a mitigation strategy related to repetitive loss properties and flood mitigation in general throughout the entire County.

The Stormwater Master Plan identifies systematic improvements or opportunities to mitigate damages from storm runoff. In this case, the mitigation strategy is applied as projects are identified and completed by the County or other entities including the Southwest Florida Water Management District.

The Comprehensive Master Plan, the ultimate planning tool for the County, includes existing and future land uses. The intent is to identify the most suitable uses for property while maintaining safety and quality of life resources available. The Environmental Sensitive Lands Program is specifically targeted at protecting wetlands. In addition, a Community Wildfire Protection Plan has been incorporated into the LMS as part of this update. The goals of the LMS related to wildfire mitigation will be implemented through an ongoing partnership with the Florida Fire Service. Upon adoption of the CWPP, the LMS committee will explore opportunities to incorporate the wildfire mitigation goals into the Comprehensive Master Planning process.

The LMS Working Group will continue to be the County's leading policy group regarding mitigation issues and will continue to recommend and set examples of what the County should be doing to mitigate hazards, improve the sustainability of the built environment, and reduce the impact and vulnerability of natural disasters.

When the Hernando County Comprehensive Plan and Capital Improvements Plan are updated or amended, the requirements of this mitigation plan will be incorporated into future amendments of these planning documents. In addition, the LMS Working Group will present the information for consideration to the regulating bodies in an attempt to incorporate the new data and philosophies into the already existing processes. For example, the hazard maps, hazard study data, or any other valid scientific data that support the need for change in the county's development codes and regulations will be forwarded to the appropriate departments for review and incorporation.

The City of Brooksville will also incorporate the requirements of this mitigation plan into future amendments of their planning documents. The 2015 Peril of Flood Act compels municipalities and counties in Florida's coastal areas to adopt goals, objectives, policies, and strategies into the coastal management element of the local government's comprehensive plan related to flood risks to real property and the built environment. The process of updating the City of Weeki Wachee and Hernando County comprehensive plans to meet the 2015 Peril of Flood Act will be an opportunity to incorporated the mitigation goals identified in the LMS into the comprehensive plans. In addition, as new information is presented, the jurisdictions shall amend their codes and regulations appropriately.

The Planning Department also has a mechanism in place to identify the potential impact to shelters related to any new developments within the evacuation zones. A process is in place whereby developers must either address evacuation concerns or work with local Emergency Management officials to develop mitigation plans or contribute financially to mitigation efforts.

Information from the most current LMS, specifically which is contained within the Risk Assessment section, will be compared against the existing Comprehensive Emergency Management Plan (CEMP.) To the extent appropriate all pertinent information will be added to the CEMP ahead of its next update.

Each of these plans, processes, procedures, and ordinances are therefore incorporated by reference to this

Local Mitigation Strategy Plan. Each is available for review at the Emergency Management office in Hernando County. Further, the participation of the members of this working group and the adoption of the plan by participating governments provides the means for integration and implementation of the Local Mitigation Strategy across multiple planning mechanisms.

The LMS plan has played a significant role in the planning and decision making process in Hernando County. Some planning decisions have been in place for quite some time, others, more recent. Among the recent planning efforts is the Peck Sink Project, which seeks to assemble large parcels of lands with the intent to keep them as open space for natural drainage. Another example is a concerted effort to mitigate public property (through wind retrofits) in an effort to protect critical facilities that support County residents during times of crisis. At the conclusion, this project will have a significant effect on future development throughout virtually the entire County.

5.4 Continued Public Involvement

The LMS Working Group will continue to involve the public during the evaluation and update of the LMS throughout the 5-year implementation cycle. This will be accomplished by providing a copy of the plan to all appropriate agencies and making copies available for public display as requested. In addition, the County will solicit public involvement by the following:

- Annual public education activities, public workshops, and public hearings
- Public meetings to solicit feedback and to obtain public input for plan evaluation
- Public education via the County's website as a means of communication by providing information about mitigation initiatives, updates on the status of the mitigation measures, and recommended revisions to the mitigation plan

A permanent entity needs to be responsible for maintaining the LMS and for monitoring, evaluating, and updating it. The LMS Working Group (with representation from all participating municipalities) represents citizen, municipal, business, educational, volunteer, and county interests through a balanced membership.

The LMS Working Group oversees the LMS plan maintenance during the 5-year implementation timeframe. The LMS Working Group will continue to meet at least once a year to perform the following:

- Evaluate the effectiveness of previously implemented mitigation actions
- Explain why any actions are not completed
- Identify any actual or perceived changes in risk or vulnerability
- Submit all revisions for adoption by all jurisdictions

Prior to the end of each 5-year implementation, the LMS Working Group will oversee a major update to the plan that follows FEMA's planning guidance. The updated plan will be submitted to the Florida Division of Emergency Management and FEMA for approval.

Appendix A
Project Prioritization

Appendix A

I. Hazard Mitigation Project/Program Prioritization Worksheet

The New Project Submission Worksheet will be utilized for identifying new projects. First, the project or program will be described and categorized by type. The initial submission will determine the extent to which the project will enhance the sustainability of the county/city/community.

Applicant Information:
Name:
Agency:
Address:
Telephone:

Project/Program Information:
Project/Program Name:
Project/Program Description:

Project/Program Category (Select One):

Project Category: Program Category:

_____Capital Projects (CIP)
_____Critical Facilities
_____Flood Proofing
_____Infrastructure
_____Property Acquisition
_____Restoration of Natural Features
_____Retrofitting of Structures
_____Stormwater Management
____Code Plus

_____Stormwater Management
_____Community Involvement
_____Feasibility Studies
_____Management Plan
_____Development/Modification
_____Public Education
_____Public/Private Partnerships
_____Regulatory Initiatives
____Public Safety

Project Type:
Please identify the type of action proposed. Check all that apply.

_____Prevention – Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.

_____Property Protection – Actions that involve the modification of existing buildings or infrastructure to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, flood proofing, storm shutters, and shatter-resistant glass.

_____Public Educational and Awareness – Actions to inform and educate citizens, elected officials, and property owners about potential risks from hazards and potential ways to mitigate them. Such actions include outreach projects, health immunization and prophylaxis, real estate disclosure, hazard information centers, and school-age and adult education program.

_____Natural Resource Protection – Actions that, in addition to minimizing hazard losses also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

_____Structural Projects – Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include storm water controls (e.g. culverts), floodwalls, seawalls, retaining walls, and safe rooms.

_____Other: Explain:

Timeliness:

The expected timeframe for completion and implementation of a project or program (upon receipt of funding).
_____Less than one year to complete or implement.
_____More than one year to complete or implement.

Project Cost:
$ _____(estimated)

II. (Flood) Mitigation Project Application

(Flood) Mitigation Project Application		Date Submitted:	
Organization:		Submitted by:	
Description of project:			
Location:		Estimated Project Cost:*	
Project's Annual Maintenance Cost:			
Circle Building Type:	1 story w/ basement	Split level w/ basement	2 story with basement
1 or 2 story w/o basement		Split level w/o basement	
Mobile Home		Other	
Year built:	Code built to:	(Example: ASCE 97-8)	
Total Floor Area (SF):		SF Occupied:	
If not owner occupied, monthly rent:			
List Special Building Contents and Estimated Value: (e.g. specialized equipment)			
Select Mitigation	a) Elevation (ft):	What is the First Floor Elevation (FFE)?	
Measure:		How many feet is the FFE being raised.	
b) Flood Barriers -		At what flood elevation will the barrier be overtopped?	
c) Acquisition/Relocation			
Value of Public/Non-		Annual Operating Budget:	
Profit Services:		Enter rent amount if not included in budget:	
In 100-year flood plain?	Yes _____No _____	Don't Know _____	
Availability of matching funds (25 percent)	Yes _____No _____	Don't Know _____	
Community name and population served or benefited:			
Longevity of benefit (how many years will the structure be in use?):			
Priority of requestor (only one project for each priority):			
Additional information or justification:			
* Attach project estimates/other cost documentation			

III. Wind Mitigation Project Application

Hurricane Wind Mitigation Project Application			
Date Submitted:			
Organization:		Submitted by:	
Description of project:			
Location:		Estimated Project Cost:*	
Project's Annual Maintenance Cost:			
Circle Building Type:	Non-Engineered, Wood	Non-Engineered, Masonry	Manufactured Building
Lightly Engineered	Fully Engineered	Other	
Miles Inland:		Number of Stories Above Grade:	
Year built:	Code built to:	(Example: ASCE 97-8)	
Total Floor Area (SF):		SF Occupied:	
If not owner occupied, monthly rent:			
List Special Building Contents and Estimated Value: (e.g. specialized equipment)			
Value of Public/Non-		Annual Operating Budget:	
Profit Services:		Enter rent amount if not included in budget:	
In 100-year flood plain?	Yes _____	No _____	Don't Know _____
Availability of matching funds (25%)	Yes _____	No _____	Don't Know _____
Community name and population served or benefited:			
Priority of requestor (only one project for each priority):			
Additional information or justification:			
* Attach project estimates/other cost documentation			

Appendix B

Planning Process

Appendix B

I. LMS Working Group Bylaws

ARTICLE I: PURPOSES OF THE COMMITTEE

The purpose of the Hernando County Local Mitigation Strategy (LMS) Committee is to decrease the vulnerability of the citizens, governments, business and institutions of the county to the future human, economic and environmental costs of natural and technological disasters. The Committee will develop, monitor, implement and maintain a comprehensive plan for hazard mitigation, which will be intended to accomplish this purpose.

ARTICLE II: MEMBERSHIP

Participation in the Committee is voluntary by all entities. Membership in the Committee is open to the various agencies of county government and all municipalities within the county, private organizations, civic organizations, water management districts, regional planning councils, independent special districts, businesses, non-profit organizations and individuals supporting its purpose.

A member in good standing is one who has attended at least 50% of the meetings during the last 12 months or 3 meetings in succession.

ARTICLE III: ORGANIZATIONAL STRUCTURE

The organizational structure of the Committee shall consist of the Executive Committee, county support staff, and other temporary subcommittees as deemed necessary by the Committee.
The Executive Committee shall consist of designated representatives of the following:

- Representatives from the government of Hernando County and each participating incorporated municipality,
- Representatives from organizations and associations representing key business, industry, and community interest groups of Hernando County, and
- Other such individuals
- The Executive Committee shall be comprised of 9-12 members who shall have the authority to approve items concerning the LMS Committee.

The Executive Committee shall be elected from the body of members who attend at least 2/3 of the regular LMS Committee meetings. In the event that a member fails to maintain this record that member may be replaced by a vote of the full LMS Committee.

The members shall be elected for terms of 1 year. Election of the Executive Committee shall coincide with the election of the LMS Chair, Vice Chair and Recording Secretary who shall automatically be on this committee.

Any member in good standing of the Committee is eligible for election as an officer: a chairperson, a vice-chairperson and a recording secretary. Officers will be elected by a majority vote of the membership. Each shall serve a term of one year and be eligible for re-election for an unlimited number of terms.

The chair will preside at each meeting of the Committee, as well as establish temporary subcommittees and assign personnel to them. The vice chair will fulfill the duties and responsibilities of the chair in his or her absence. The Recording Secretary will be the record keeper for the LMS Committee and will fulfill the duties and responsibilities of the chair in the absence of the chair and vice chair.

The Hernando County Sheriff's Office Emergency Management personnel will provide technical support and assist with coordination of the Committee.

Temporary subcommittees may be established at any time for special purposes by the chair of the Executive Committee, and their membership designated at that time.

ARTICLE IV: RESPONSIBILITIES

The Committee will be responsible for oversight and coordination of all actions and decisions by the Committee and is solely responsible for formal actions in the name of the LMS Committee, including the release of reports, development of resolutions and similar activities.

Planning: To develop and revise a Local Mitigation Strategy as necessary, to coordinate mitigation activities within the County, to set an order of priority for local mitigation projects and to submit annual LMS updates to the Florida Division of Emergency Management as required. To identify, analyze and monitor the hazards threatening Hernando County and the vulnerabilities of the community to those hazards, as well as to assist in the definition of actions to mitigate the impacts of those hazards; to define structural and non-structural actions needed to decrease the human, economic and environmental impacts of disasters, and to plan a strategy for implementation of those initiatives in both the pre- and post-disaster time frame; to define the general financial vulnerability of the community to the impacts of disasters; to assist with identification of initiatives to minimize vulnerabilities; and to seek funding sources for all priority mitigation initiatives identified in the mitigation strategy developed by the Committee.

Public Information: To secure public input and comment on the efforts of the Committee; to inform the public about the activities of the Committee, to conduct public information and education programs regarding hazard mitigation; to assist with the conduct of public hearings; and, to promote public acceptance of the strategy developed by the Committee. To promote disaster preparedness and mitigation at the community/individual level through partnerships and volunteerism.

ARTICLE V: ACTIONS BY THE COMMITTEE

A. Authority for Actions

Only the LMS Executive Committee has the authority to take final actions in the name of the LMS Committee. Actions by subcommittees or program staff are not considered as final until affirmed by action of the LMS Executive Committee.

B. Meetings, Voting and Quorum

Meetings will be conducted in accord with the most current Robert's Rules of Order, if and when deemed necessary by chair of the meeting. At a minimum, the committee will meet annually.

Additional meetings may be scheduled quarterly or semi-annually based on the needs or as requested by the any of Executive Committee members. All meetings will be publicly advertised with a minimum of 10 working days' notice.

All final actions and decisions made in the name of the LMS Committee will be by affirmative vote of a quorum of the Executive Committee. A quorum shall consist of voting members present. Each member shall have one vote.

C. Special Votes

Special votes may be taken under emergency situations or when there are other extenuating circumstances that are judged by both the chair and vice chair of the Executive Committee to prohibit scheduling a regular meeting. Special votes may be by email, fax and/or first class mail, and shall be in accord with all applicable statutes for such actions. A quorum shall consist of voting members that respond within the set time period.

D. Public Hearings

When required by statute or the policies of Hernando County, or when deemed necessary by the Executive Committee, a public hearing regarding actions under consideration for implementation by the LMS Committee will be held.

E. Documentation of Actions

All meetings and other forms of action by the LMS Executive Committee and subcommittees will be documented and made available for inspection by the public.

F. Sunshine Law

The LMS Committee will abide by the Florida Sunshine Law.

ARTICLE VI: ADOPTION AND AMENDMENTS TO THE BYLAWS

The Bylaws of the LMS Committee may be adopted and/or amended by a two-thirds majority vote of the members in good standing of the Executive Committee. All proposed changes to the bylaws will be provided to each member of the Executive Committee not less than ten working days prior to such a vote.

ARTICLE VII: DISSOLUTION OF THE COMMITTEE

The LMS Committee may be dissolved by affirmative vote of 60%of the members of the Executive Committee at the time of the vote, by order of a court of competent jurisdiction, and/or by instruction of the Hernando County governing body. At the time of dissolution, all remaining documents, records, equipment and supplies belonging to the LMS Committee will be transferred to Hernando County for disposition.

II. Email to Stakeholders

Cara W Serra

From: Cara W Serra
Sent: Thursday, December 5, 2019 10:33 AM
To: Erin Thomas; randerson@cityofweekiwachee.us; spsnbarton@yahoo.com; James Billotte; Clay Black; Cristi Charlow; John Burnett; Kevin Carroll; David.Casto@sumtercountyfl.gov; ieppig@pascocountyfl.net; Kevin Ford; Rebecca Garrett; bgeiger@cityofbrooksville.us; c.greenwellesq@yahoo.com; Scott Herring; Jeff Holcomb; James Johnson; mkutney@cityofbrooksville.us; Fred LaPiana; rlawson@wrec.net; Chris Linsbeck; nina.mattei@flhealth.gov; swampdad@outlook.com; Kasey Kupcik; gkm59@aol.com; Gordon Onderdonk; Jason.Packard@FreshFromFlorida.com; Manuel Padron; Cecilia Patella; Ronald Pianta; Valerie Pianta; rradacky@cityofbrooksville.us; brandy.estridge@duke-energy.com; paul.siddall@em.myflorida.com; Donnie Singer; Jodi Singer; sean@tbrpc.org; Judith.tear@freshfromflorida.com; Dawn Velsor; James Wunderle
Subject: LMS Draft Chapters 1 & 2
Attachments: 1 Introduction.docx; 1 Introduction.pdf; 2 Planning Process.docx; 2 Planning Process.pdf

Good morning LMS Planning Committee,

Attached are the first drafts of chapters 1 and 2 of the document. The remaining chapters will follow on Dec. 13th. Please provide initial comments to myself or Erin no later than Friday, January 10, 2020. The next meeting will be held on Wednesday January 15th, and will involve reviewing the first draft.

Thanks

Cara W Serra
Comprehensive Resiliency Planner
Tampa Bay Regional Planning Council
4000 Gateway Centre Blvd, Pinellas Park, FL 33782
Email: cara@tbrpc.org
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Web: www.tbrpc.org
Convening the Region since 1962

III. Meeting Minutes and Sign in Sheets

Hernando County, Florida

LOCAL MITIGATION STRATEGY WORKING GROUP

Chuck Morton, Chairman ~ Bill Geiger, Vice-Chairman ~ Greg Myers, Recording Secretary

Meeting Minutes –April 5, 2016

Meeting Location – Emergency Operations Center – Brooksville, FL

Meeting called to order by Chairman Chuck Morton at 9:00 a.m. Chairman Morton presented the agenda for our current meeting to each member and guest. Chairman Morton led the group in the Pledge of Allegiance.

Kevin Ford confirmed the public meeting notice was published in the Tampa Bay Times and was displayed on the County and City websites'.

Meeting minutes from the meeting of January 22, 2016 were accepted as submitted. Motion by Cecilia Patella to accept the minutes, seconded by Greg Myers. Motion passed.

Chairman Morton asked for any committee reports. None to report.

OLD BUSINESS:

Cecilia Patella reported that the Annual Progress Report is completed and will be sent out to the LMS Executive Committee for approval prior to submission to the BOCC.

NEW BUSINESS:

Cecilia Patella updated the group on the school shelter retrofit project. The work is currently being assessed by doing an Engineer's Survey to access which buildings could be retrofitted. Grant money received is $918,000.00 with another $465,000.00 additional that will be available. Grant money must be used for public shelter retrofits only. The State of FL is currently working to resolve the shelter deficit in Counties that are short.

Cecilia Patella updated the group on the repetitive loss mitigation projects are complete. All properties have been acquired and the land has been cleared.

Cecilia Patella reported that the CRS deadline this year is October 1, 2016. Anyone with items to submit should send them to Kevin Ford at EM at least 30 days prior to this deadline.

LMS COMMITTEE MINUTES

APRIL 5, 2016

PAGE TWO

Chairman Morton asked for any public comments and any closing comments. Various group comments were addressed and discussed.

Cecilia Patella reported there will not be a 2016 Hurricane Expo. The EM will be participating in the Hernando County Sheriff's Night Out. Community outreach is ongoing through-out the year. Based on prior Night Out events, the EM has reached more people at this one single event then by hosting a Hurricane Expo.

Next meeting will be planned for July 13, 2016 at 9 a.m.

Motion by Greg Myers, seconded by Angel Turner to adjourn. Motion passed. Meeting adjourned at 9:35AM.

Local Mitigation Strategy (LMS) Meeting

5 April 2016

Hernando County Emergency Operations Center

18900 Cortez Blvd, Brooksville Fl 34601

NAME	EMAIL	SIGNATURE
Chuck Morton (Chairman)	swampdad@juno. com	
Bill Geiger (Vice Chair)	bgeiger@cityofbrooksville.us	
Greg Myers (LMS Secretary)	gkm59@aol.com	
Cecilia Patella	cpatella@hernandosheriff.org	
Kevin Ford (Coordinator)	kford@hernandosheriff.org	
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[illegible]	[illegible]	
Clay Black	CBlack@co.Hernando.fl.us	Clay Black
Cecilia Patella	on file	
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Hernando County, Florida

LOCAL MITIGATION STRATEGY WORKING GROUP

Chuck Morton, Chairman ~ Bill Geiger, Vice-Chairman ~ Greg Myers, Recording Secretary

Meeting Minutes –April 12, 2017

Meeting Location – Emergency Operations Center – Brooksville, FL

Meeting called to order by Chairman Chuck Morton at 9:11 a.m. Chairman Morton presented the agenda for our current meeting to each member and guest. Chairman Morton led the group in the Pledge of Allegiance.

Kevin Ford confirmed the public meeting notice was published in the Tampa Bay Times and was displayed on the County and City websites'. Also was announced on the Sheriff's website and disseminated via social media outlets.

Meeting minutes from the meeting of January 11, 2017 were accepted as submitted. Motion by Bill Geiger to accept the minutes, seconded by Cecilia Patella. Motion passed.

Chairman Morton asked for any committee reports. None to report.

OLD BUSINESS:

Kevin Ford reported that the LMS reporting letter to the State of FL was accepted and approved. Kevin Ford presented the most current updated 2017 project list that was sent to the State attached to the same letter.

Cecilia Patella updated the group that the mitigation money from FEMA allocated to Hernando County from our last storm Hermine has become available and monies are beginning to flow into the County. She updated the group that these monies will be list of projects that were on the recovery plan.

Bill Geiger requested that Kevin Ford send out, via email, the updated complete LMS Project list to all the LMS members.

NEW BUSINESS:

Kevin Ford reviewed with the group the most recent LMS Project List and it was noted that the following Hernando County FD station numbers need to be updated on the list: Station 22 is now 8; Station 23 is now 9. The group also requested that we assigned "project numbers" to each project and this assigned number will stay with the project.

NEW BUSINESS (cond't)

Chairman Morton asked for any Public Comments. None stated.

Chairman Morton asked for any group or staff comments. Group discussed various subjects affecting the County and the LMS Committee.

Chairman Morton asked for any other announcements. None stated.

Next meeting is scheduled for July 12, 2017 at 9 a.m located at the Hernando County EOC.

Motion by Greg Myers, seconded by Kevin Carroll to adjourn. Motion passed. Meeting adjourned at 9:38 a.m.

Local Mitigation Strategy (LMS) Meeting

12 April 2017

NAME	EMAIL	SIGNATURE
Chuck Morton (Chairman)	swampdad@juno.com Swampdad@outlook.com	
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Robert Kern	rbkern@gmail.com	

Hernando County, Florida

LOCAL MITIGATION STRATEGY WORKING GROUP

Chuck Morton, Chairman ~ Bill Geiger, Vice-Chairman ~ Greg Myers, Recording Secretary

Meeting Minutes – April 26, 2018

Meeting Location – Emergency Operations Center – Brooksville, FL

Meeting called to order by Chairman Chuck Morton at 9:01 a.m. Chairman Morton presented the agenda for our current meeting to each member and guest. Chairman Morton led the group in the Pledge of Allegiance.

Kevin Ford confirmed the public meeting notice was published in the Tampa Bay Times and was displayed on the County and City websites'. Also was announced on the Sheriff's website and disseminated via social media outlets.

Meeting minutes from the meeting of December 7, 2017 were accepted as submitted with one correction on the spelling of "Molton" should be "Moton" under Old Business, second paragraph. Motion by Bill Geiger to accept the minutes with corrections, seconded by Greg Myers. Motion passed.

Chairman Morton asked for any committee reports. None to report.

OLD BUSINESS:

Kevin Ford reported that the 2018 CRS re-certification will require an onsite visit. A date will be set for the visit in the near future.

Kevin Ford reported the FEMA fiscal year 2017 NOFO update was revised with the new numbers being $1,818,711.40 (75% portion) and a 25% match of $606,237.13 for Hernando County.

NEW BUSINESS:

Kevin Ford reminded the group that the HMGP projects must be submitted by August 6, 2018. Be sure your application is in detail as the reviewer's no nothing about Florida. Be sure to provide your supporting documents.

Mark Caskie with Hernando County Waterways & Aquatic Services presented a new LMS project to the group. Plans call for demolition of the existing 1995 building and replace with a new stilt building with office space. Estimated costs are $450,000. - $500,000. to build the new building.

NEW BUSINESS (cond't):

Prioritized List deadline is June 1, 2018 to allow for time to review the applications before submitting to the State.

Motion by Cecilia Patella, seconded by Greg Myers, to allow late submissions of grant applications (in the order received). Motion passed.

Kevin Ford led the group in the review of the prioritized LMS Projects List. The group added 3472 Jewfish Drive, Hernando Beach, project for a wind retro fit and flood vent. The group then clarified the prioritized listing, based on the most recent list, in the order below:
1. Hernando County FD; 2. Gray & Robinson – Broad Street & Powell Road; 3. Culbreath Road; 4. Hernando County Waterways & Aquatic Services; 5. Fields House; 6. 3472 Jewfish Drive; 7. Snute's House. Motion by Cecilia Patella, seconded by Greg Myers to accept the order above with all being a High Level with the exception of 5, 6 & 7 being a Medium Level.

The group took a short break from 10:40a to 11:00a to redo the priority on the Projects List for ease in reading. Motion by Cecilia Patella, seconded by Greg Myers, to accept the new prioritized order on the LMS Projects Lists. Motion passed.

Chairman Morton asked for any public, group or staff comments.

Chairman Morton asked for any other announcements. None stated.

Next meeting date and time is set for July 11, 2018 at 9a.m. A possible meeting might be needed in May, 2018 but an announcement will go out if meeting is needed.

Motion by Greg Myers, seconded by Cecilia Patella to adjourn. Motion passed. Meeting adjourned at 11:22 a.m.

Local Mitigation Strategy (LMS)
Hazard Mitigation Grants Meeting

26 April 2018

NAME	EMAIL	SIGNATURE
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Tim Fagan	tfagan@pascocountyfl.net	
TIM SMITH	TJSMITH@PASCOCOUNTY.FL.NET	
Erin Thomas	ethomas@hernandocounty.us	

Hernando County, Florida

LOCAL MITIGATION STRATEGY WORKING GROUP

Chuck Morton, Chairman ~ Bill Geiger, Vice-Chairman ~ Greg Myers, Recording Secretary

Meeting Minutes – September 25, 2019

Meeting Location – Emergency Operations Center – Brooksville, FL

** PUBLIC MEETING – FIRST PUBLIC MEETING FOR LMS PLAN UPDATE **

Meeting called to order by Chairman Chuck Morton at 9:04 a.m. Chairman Morton presented the agenda for our current meeting to each member and guest. Chairman Morton led the group in the Pledge of Allegiance.

Kevin Ford confirmed the public meeting notice was published in the Tampa Bay Times and was displayed on the County and City websites'. Also was announced on the Sheriff's website and disseminated via social media outlets.

OLD BUSINESS:

None.

NEW BUSINESS:

Cara Sera of TBRPC reviewed the update plan for the 2020 update of the LMS Plan. This meeting is the first public meeting for this LMS Plan update.

Cara Sera presented to the group a power point presentation reviewing the timeline for the planning meetings. They will be October 16, 2019; November 20, 2019; January 15, 2020 and February 26, 2020. Cara Sera said the update will be reviewing the hazards of Hernando County as defined by the State so as to incorporate into the LMS Plan. There will be a review of the vulnerability assessment and critical facilities. One suggestion is to produce a flow chart of who should respond to a hazardous situation so 911 knows who to call.

Chairman Morton asked for any other announcements. None stated.

Next meeting date and time is set for October 16, 2019 at 9a.m.

Motion by Greg Myers, seconded by Cecilia Patella to adjourn. Motion passed. Meeting adjourned at 10:23 a.m.

PLEASE SIGN IN

September 25, 20:1.9

Hernando LMS Planining Commiittee

Name	Agency/Jurisdiction/Team	En,aJI
Clay Black	Her Co DPW	CBlackeco. hernando.fl. us
Nina Matté	FlDept of Health	Nina.Matté@FlHealthGov
Chuck Morton	Lms Committee Chair	Swamp dael @ outlook .com
Gordon Onderdonk	HCUD	gonderdonK@hernandolawyer
Gregg Myers	UCHC	GKM59@gol.com
James S. Yunderle	Hernando Purchasing	Jyunderle@hernandocounty.us
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DAVID SNUTES		OSNUTS3@NSF.NST
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Rebecca Garrett	Zoning	Rgarrett@hernandoCounty.us
Charles D Greenwell	Flood Plan - Hernando County	C. Greenwellesq@Yahoo
Kevin Carroll	HCFR	KCarroll@hernandocty.us
Judith Tear	FL Forest Service	Judith.Tear@FDACS.
Erin Thomas	HCEM	ethomas@hernandogov county.us
Cecilia Patella	HCEM	cpatella@hernando county.us

Hernando County, Florida

LOCAL MITIGATION STRATEGY WORKING GROUP

Chuck Morton, Chairman ~ Bill Geiger, Vice-Chairman ~ Greg Myers, Recording Secretary

Meeting Minutes – October 16, 2019

Meeting Location – Emergency Operations Center – Brooksville, FL

** PUBLIC MEETING – SECOND PUBLIC MEETING FOR LMS PLAN UPDATE **

Meeting called to order by Chairman Chuck Morton at 9:10 a.m. Chairman Morton presented the agenda for our current meeting to each member and guest. Chairman Morton led the group in the Pledge of Allegiance.

The public meeting notice was published in the Tampa Bay Times and was displayed on the County and City websites'. Also was announced on the Sheriff's website and disseminated via social media outlets.

OLD BUSINESS:

None.

NEW BUSINESS:

Cara Sera of TBRPC reviewed the update plan for the 2020 update of the LMS Plan. This meeting is the second public meeting for this LMS Plan update.

Cara Sera presented to the group a power point presentation reviewing the hazards identified in Hernando County. Some of these hazards will require outside agencies to interact with this update. She also reviewed the criteria of the ranking system and how it is arrived at.

Cara Sera reviewed the Wildfire Protection Plan (WPP). The State Forestry Service will be coming into the Emergency Management office to work with incorporating the WPP into this LMS Plan update. Cara Sera reviewed the ranking of the hazards based on the type of hazard over a period of time and the impact they had to Hernando County. The Plan will show the location of these hazards, i.e. for flooding there is a flood map, for wildfires there is a wildfire map.

It was discussed what the effects of erosion is in Hernando County, both coastal and river, and this will be referenced in the revised Plan. Group discussion on how data can be collected for Summer thunderstorms in our area that have had a significant impact that may need to be addressed in this LMS Plan update. Previous events will be identified by date and event and will be documented in the new update.

There are three water sheds identified, mapped and adopted for administration purposes and are not yet on the 2012 FIRM map, but will be, so this will need to be included in the upcoming.

The group continued discussions during Cara Sera's review of the hazards that have impacted Hernando County over the years and how to best represent these on the revised Plan based on the State's criteria for these hazards.

Cara Sera presented a short form and long form version of a survey that can be handed out and be available online at the County's website. Group discussion on the survey and the layout/content.

Chairman Morton asked for any other announcements. None stated.

Next meeting date and time is set for November 20, 2019 at 9 a.m.

Motion by Chairman Morton, seconded by John Barnett to adjourn. Motion passed. Meeting adjourned at 11:03 a.m.

PLEASE SIGN IN
October 16, 2019
Hernando LMS Planning Committee

Name	Agency/Jurisdiction/Team	Email
[signature]	Hernando County D.P.W.	jdunb@co.hernando.fl.us
Rebecca Garrett	Zoning	Rgarrett@hernandocount.gov
Kevin Carroll	HCFR	KCarroll@hernandocounty.us
Chuck Morton	LMS Chair	Swamphead@juno.com
Charles D Greenwell	HBPLA	C. Greenwellesq@yahoo.com
Erin Thomas	Hernando EM	ethomas@hernandocounty.us
Cara Serra	TBRPC	Cara@tbrpc.org

Hernando County, Florida

LOCAL MITIGATION STRATEGY WORKING GROUP

Chuck Morton, Chairman ~ Bill Geiger, Vice-Chairman ~ Greg Myers, Recording Secretary

Meeting Minutes – November 20, 2019

Meeting Location – Emergency Operations Center – Brooksville, FL

Meeting called to order by Chairman Chuck Morton at 9:08 a.m. Chairman Morton presented the agenda for our current meeting to each member and guest. Chairman Morton led the group in the Pledge of Allegiance.

The public meeting notice was published in the Tampa Bay Times and was displayed on the County and City websites'. Also was announced on the Sheriff's website and disseminated via social media outlets.

Chairman Morton suggested that the annual LMS elections be held at this meeting so will not need to call a meeting in December for just the elections. Motion by Greg Myers, seconded by Cecilia Patella to hold the elections at this meeting. Motion passed.

Motion by Erin Thomas, seconded by Judi Tear to elect Chuck Morton as Chairman, Bill Geiger as Vice Chairman and Greg Myers as Recording Secretary of the LMS Working Group for year 2020. Motion passed.

The LMS Group then adjourned and reconvened for the Public Meeting for LMS Plan update.

** PUBLIC MEETING – THIRD PUBLIC MEETING FOR LMS PLAN UPDATE **

OLD BUSINESS:

None.

NEW BUSINESS:

Cara Sera of TBRPC reviewed the vulnerability assessment of Hernando County is almost complete. Cara Sera is needing a parcel map. It was shared that the Property Appraiser's GIS mapping system does identify the repetitive flood loss properties.

Cara Sera presented to the Group the Incorporating Resiliency into the LMS Plan update. The Group reviewed the wording and offered any suggestions/updates.

Cara Sera reviewed the 2015 mitigation goals to see if any updates/changes are needed. Group followed with discussion on these goals. Education of the residents on Fire Wise is essential.

Chairman Morton asked for any other announcements. None stated.

Next meeting date and time is set for January 25, 2020 at 9 a.m.

Motion by Greg Myers, seconded by Cecilia Patella to adjourn. Motion passed. Meeting adjourned at 9:54 a.m.

** PUBLIC WORKSHOP MEETING – LMS PLAN UPDATE **

Chairman Morton called the meeting to order at 9:55A

Group discussion on a possible siren warning system for coastal residents. Cecilia Patella reviewed prior research on this type of a warning system and how it may not be practical for our County.

Judi Tear with the Florida Forestry Service invited everyone to their Forestry Wildfire Season meeting on January 22, 2020 at the Training Center from 9:30a to Noon.

Motion by Greg Myers, seconded by Cecilia Patella to adjourn. Motion passed. Meeting adjourned at 10:18 a.m.

LOCAL MITIGATION STRATEGY (LMS) WORKING GROUP 2019			Wednesday, November 20, 2019	
Last Name	*First Name*	*Organization*	*E-mail*	*Signature*
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Geiger	Bill (Vice Chair)	Community Development Director, City of Brooksville	bgeiger@cityofbrooksville.us	
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Lawson	Ron	Withlacoochee River Electric Cooperative	rlawson@wrec.net	
Linsbeck	Chris	Zoning Supervisor/Administrative Official, Hernando County Planning and Zoning	Clinsbeck@hernandocounty.us	
Mattei	Nina	Florida Department of Health in Hernando County	nina.mattei@flhealth.gov	
Morton	Chuck (Chair)	Coastal Hernando Bus. Assoc., Hernando County Port Authority	swampdad@outlook.com	
Myers	Greg (Secretary)	Plantation Estates Owners Association	gkm59@aol.com	
Onderdonk	Gordon	Director, Hernando County Utilities	gonderdonk@hernandocounty.us	
Packard	Jason	Forest Area Supervisor, Florida Forest Service	Jason.Packard@FreshFromFlorida.com	
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Thomas	Erin	Coordinator, Hernando County Emergency Management	ethomas@hernandocounty.us	
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Hernando County, Florida

LOCAL MITIGATION STRATEGY WORKING GROUP

Chuck Morton, Chairman ~ Bill Geiger, Vice-Chairman ~ Greg Myers, Recording Secretary

Meeting Minutes – January 15, 2020

Meeting Location – Emergency Operations Center – Brooksville, FL

Meeting called to order by Chairman Chuck Morton at 9:12 a.m. Chairman Morton presented the agenda for our current meeting to each member and guest. Chairman Morton led the group in the Pledge of Allegiance.

The public meeting notice was published in the Tampa Bay Times and was displayed on the County and City websites'. Also was announced on the Sheriff's website and disseminated via social media outlets.

** PUBLIC MEETING – FOURTH PUBLIC MEETING FOR LMS PLAN UPDATE **

OLD BUSINESS:

None.

NEW BUSINESS:

Cara Sera of TBRPC reviewed the draft one of the LMS Plan update with the group. She highlighted the changes made to the updated Plan. The survey will be on the County's website for a period of up to when the Plan is sent to the State. The Group agreed to post the survey annually on the County's website in the future.

The Group discussed the prior suggestions submitted for draft one. Cecilia Patella stated she will review the dollar amounts for projects 2,6,7 & 9 and get updated amounts for the Project List. Project 10 is a private community project and Project 11 is funded but not yet accepted by the BOCC. The Group further discussed the ranking system on the Project List and agreed it is best the way it currently is being ranked. The hazard name "Hurricane" will be changed to "Tropical Cyclone" in the updated Plan. Any additional updates/corrections should be to Cara Sera no later than February 17, 2020.

Chairman Morton asked for any other announcements. None stated.

Next meeting date and time is set for February 26, 2020 at 9 a.m.

Motion by Greg Myers, seconded by Cecilia Patella to adjourn. Motion passed. Meeting adjourned at 10:27 a.m.

** PUBLIC WORKSHOP MEETING – LMS PLAN UPDATE **

Chairman Morton called the meeting to order at 10:30A

Judi Tear with the Florida Forestry Service along with the Southwest FL Water Management District (SWFWMD) are conducting a controlled burn in the Richloam Tract & Green Swamp off of State Road 471 in Eastern Hernando County. This will be a controlled burn of approximately 24,000 acres. This will be referred to as "The Big Burn". The Big Burn is slated for some time in February 2020 depending on weather conditions but advance word will be given of the exact period when known. There will be road closures and detouring of traffic to accommodate this event.

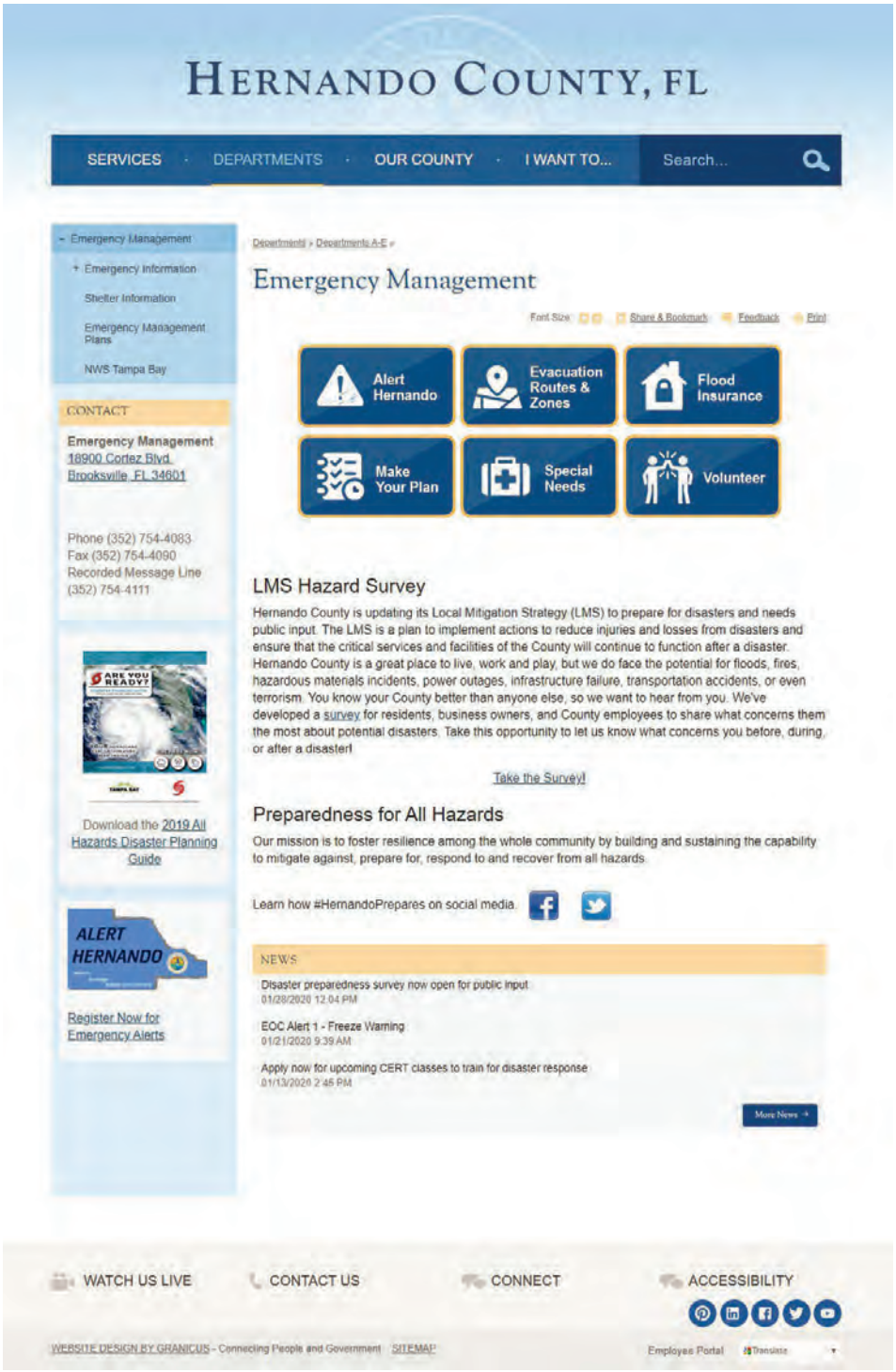
Chairman Morton ask the Group for anymore additions or comments on Draft One of the LMS Plan update. None stated.

Motion by Greg Myers, seconded by Cecilia Patella to adjourn. Motion passed. Meeting adjourned at 10:40 a.m.

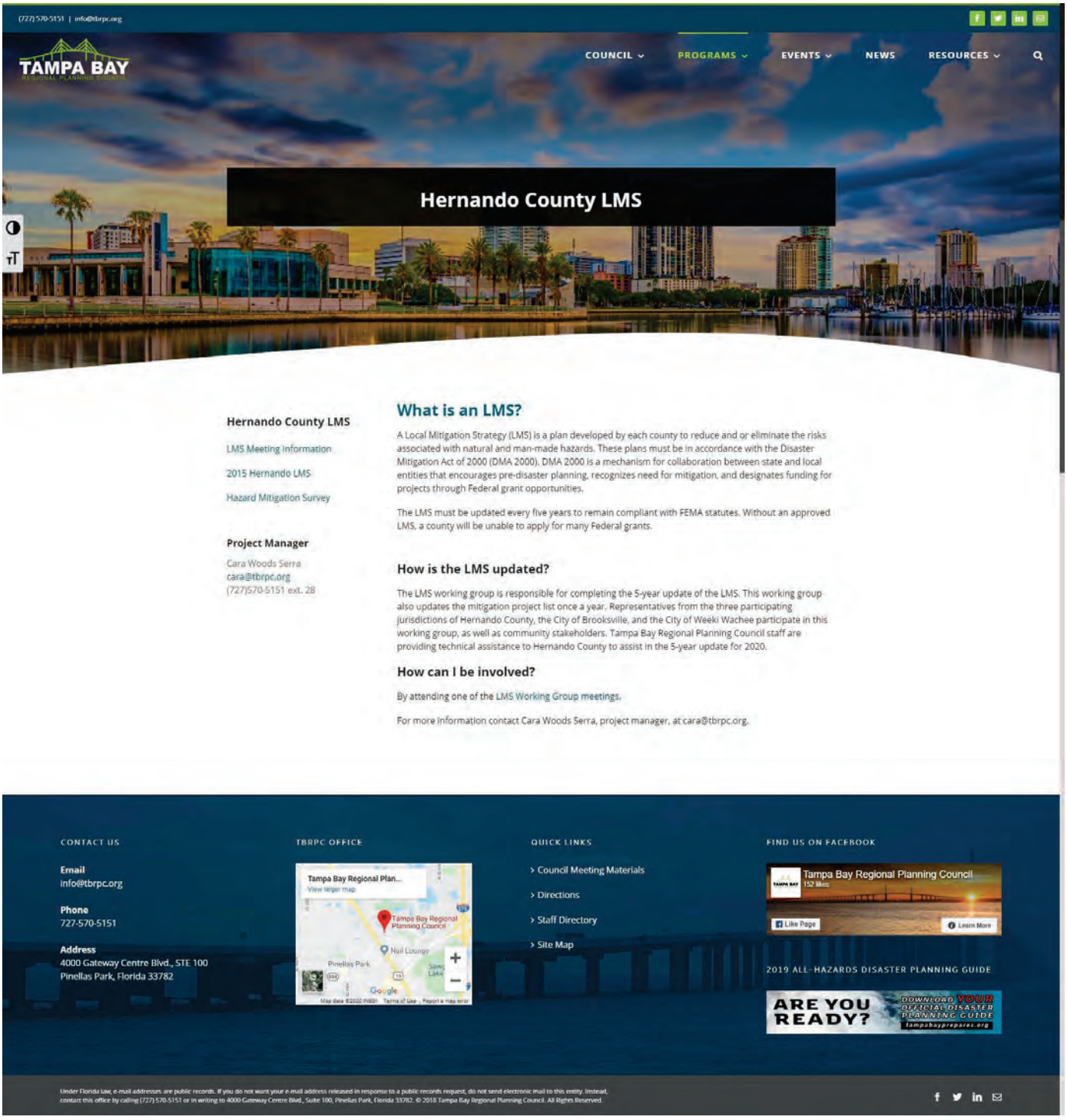
PLEASE SIGN IN
January 15, 2020
Hernando LMS Planning Committee

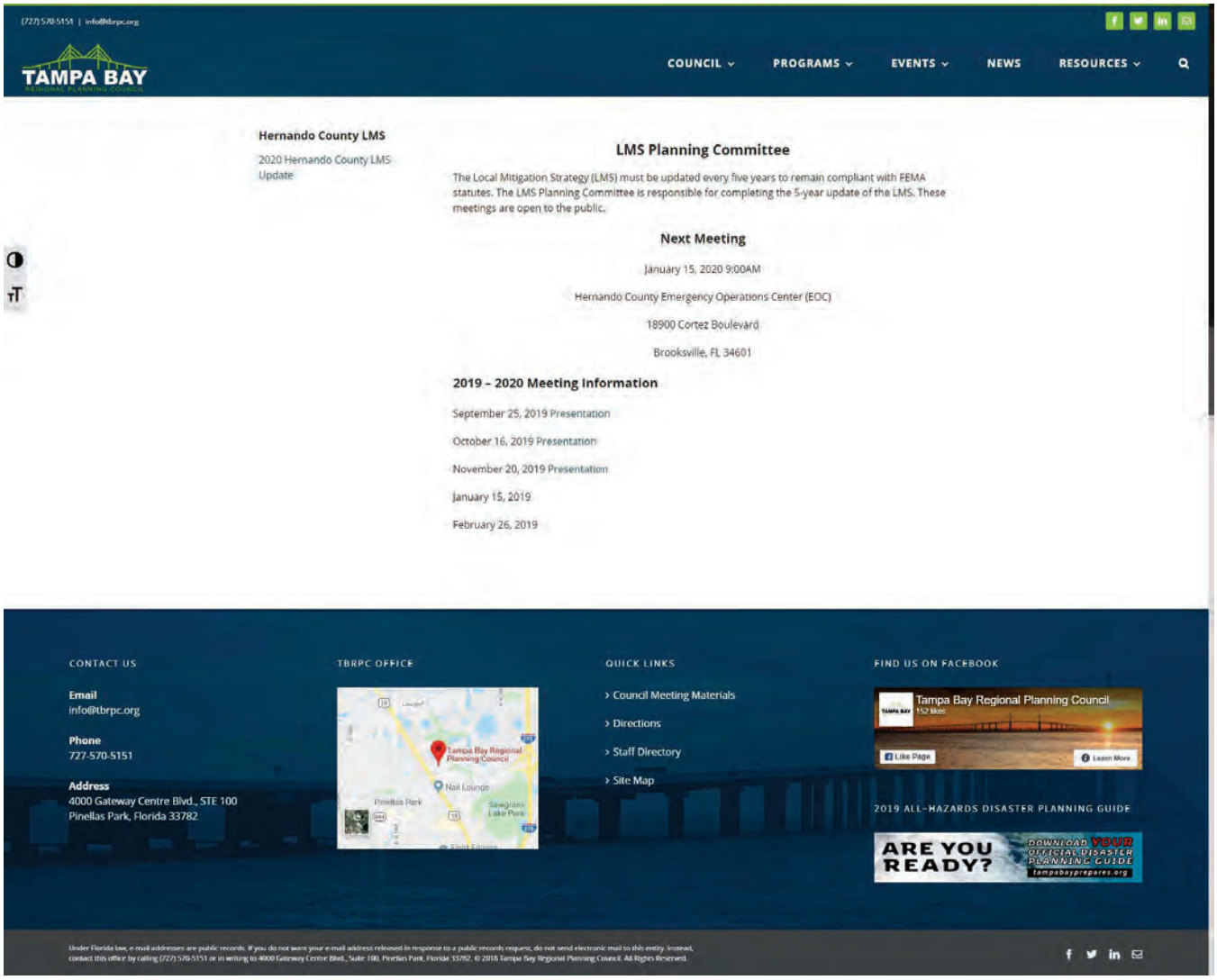
Name	Agency/Jurisdiction/Team	Email
Greg Myers	UCHC	GM59@aol.com
Cecilia Patella	HCEM	cpatella@hernandocounty.us
Kevin Ford	citizen	KAFord63@gmail.com
Angie Aborizk	FDOT	angela.aborizk@dot.state.fl.us
Clay Black	Her Co DPW	cblack@co.hernando.fl.us
Jim Billotte	HCFR	jbillotte@hernandocounty.us
Renee Borden	Pasco County EM	erborden@pascocounty.net
Scott Herring	H.C. DPW	sherring@hernandocounty.us
Cara W Serra	TBRPC	Cara@tbrpc.org
Brian Ellis	TBRPC	Brian@tbrpc.org
GORDON ANDERDON	HCUD	GANDERDON@HERNANDO.FL.US
Charles D. Greenwell	HBPOA	C.Greenwellesp@Yahoo.com
Erin Thomas	EM	ethomas@hernandocounty.us
Chuck Morton	Chair	Swamprd@outlook.com
John Burnett	H.C. DPW	Jburnett@co.hernando.fl.us
Nina Mattu	Health Dept.	Nina.mattu@flhealth.gov
Judith Tear	FFS	Judith.Tear@FDACS.gov
Josh Diehl	FFS	

LMS Update Information on the Hernando County Website



TBRPC Website with LMS Meeting Info

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TAMPA BAY
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Hernando County LMS
2020 Hernando County LMS Update
LMS Planning Committee
The Local Mitigation Strategy (LMS) must be updated every five years to remain compliant with FEMA statutes. The LMS Planning Committee is responsible for completing the 5-year update of the LMS. These meetings are open to the public.
Next Meeting
January 15, 2020 9:00AM
Hernando County Emergency Operations Center (EOC)
18900 Cortez Boulevard
Brooksville, FL 34601
2019 – 2020 Meeting Information
September 25, 2019 Presentation
October 16, 2019 Presentation
November 20, 2019 Presentation
January 15, 2019
February 26, 2019
CONTACT US
Email
info@tbrpc.org
Phone
727-570-5151
Address
4000 Gateway Centre Blvd., STE 100
Pinellas Park, Florida 33782
TBRPC OFFICE
Tampa Bay Regional Planning Council
Nail Lounge
Pinellas Park
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Sample Public Notice

0000017548-01

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Published Daily

STATE OF FLORIDA
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Before the undersigned authority personally appeared **Deirdre Almeida** who on oath says that he/she is **Legal Advertising Representative** of the **Tampa Bay Times** a daily newspaper printed in St. Petersburg, in Pinellas County, Florida; that the attached copy of advertisement, being a Legal Notice in the matter **RE: CLK19-159** was published in **Tampa Bay Times: 9/20/19** in said newspaper in the issues of **Buyllnk Hernando Citrus**

Affiant further says the said **Tampa Bay Times** is a newspaper published in Hernando, Citrus County, Florida and that the said newspaper has heretofore been continuously published in said Hernando, Citrus County, Florida each day and has been entered as a second class mail matter at the post office in said Hernando, Citrus County, Florida for a period of one year next preceding the first publication of the attached copy of advertisement, and affiant further says that he/she neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Signature Affiant

Sworn to and subscribed before me this **09/20/2019**

Signature of Notary Public

Personally known X or produced identification

Type of identification produced

CLK19-159

NOTICE OF PUBLIC MEETING
HERNANDO COUNTY EMERGENCY MANAGEMENT
LOCAL MITIGATION STRATEGY COMMITTEE MEETING

Notice is hereby given that the Hernando County Local Mitigation Strategy (LMS) Committee will hold a public meeting on Wednesday, September 25, 2019, at the Hernando County Emergency Operations Center (EOC), 18900 Cortez Blvd., Brooksville, FL 34601 at 9:00 AM. The purpose of this meeting is to begin working on the five-year update and re-submittal of the LMS for Hernando County.

The LMS is a plan developed with input from the community, business and industry and local government to reduce or eliminate long-term risks to people, property, and the environment, reduce future losses, and manage post-disaster recovery. The Hernando County LMS was developed in 1998. The plan must be updated and reviewed annually and re-submitted every five years to FEMA. The current LMS was approved by FEMA in September 2015 and will expire in September 2020.

Hernando County Emergency Management is requesting the participation of members of the public as well as community and business leaders to help review and update the LMS.

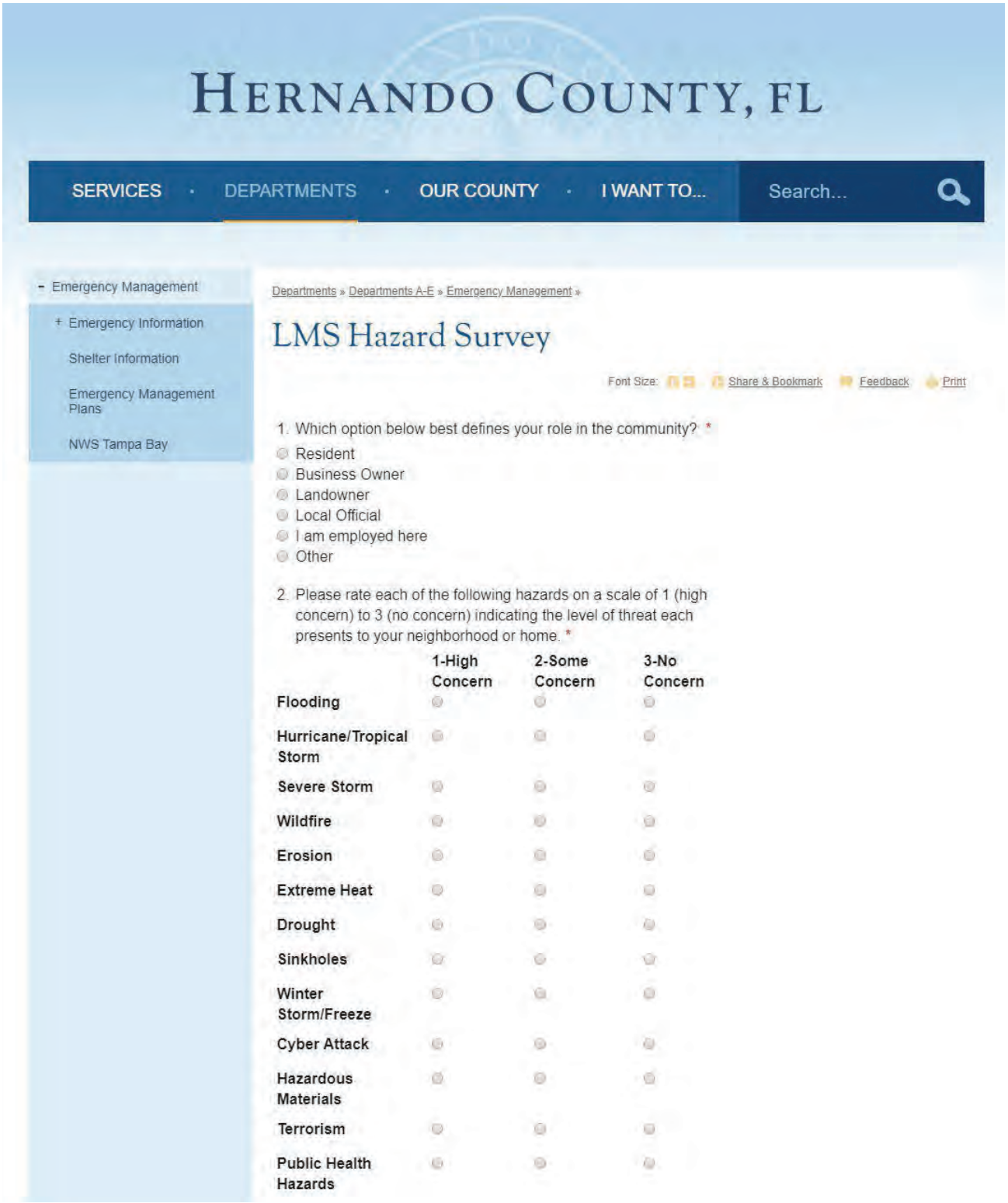
Information concerning the LMS will be on file and available for examination at the Hernando County EOC. If there are any questions or comments regarding this meeting, please contact Emergency Management at 352-754-4083. Written comments can be mailed to Hernando County Emergency Management, 18900 Cortez Blvd., Brooksville, FL 34601.

In accordance with the Americans with Disabilities Act, persons with disabilities needing a special accommodation to participate in this proceeding should contact Erin Thomas at 352-754-4083. If hearing impaired, please call 1-800-676-3777 for assistance.

September 20, 2019 0000017548

JEAN M MITOTES
State of Florida-Notary Public
Commission # GG009269
My Commission Expires
July 06, 2020

Online Hazards Survey



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LMS Hazard Survey

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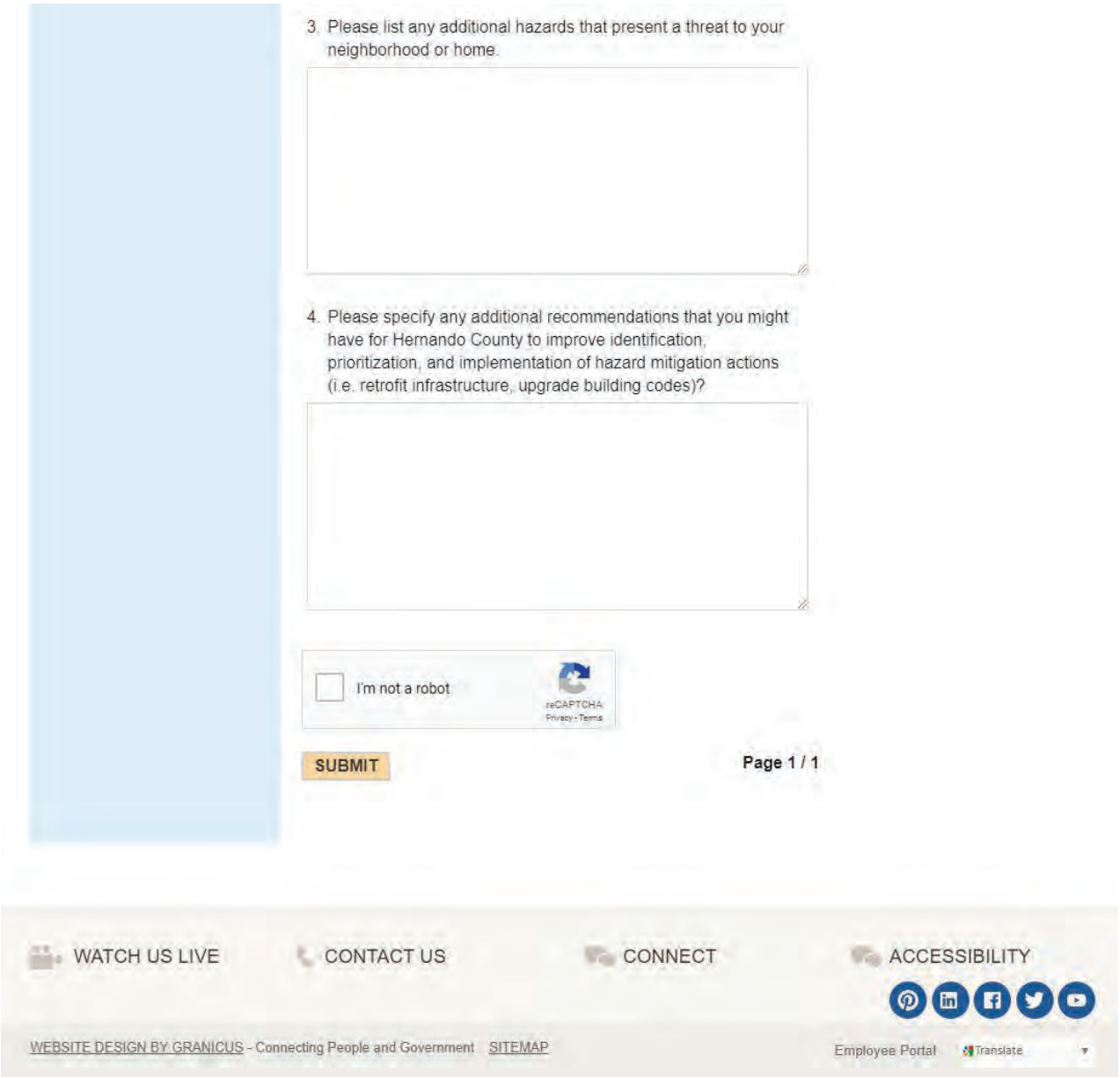
1. Which option below best defines your role in the community? *
- Resident
- Business Owner
- Landowner
- Local Official
- I am employed here
- Other

2. Please rate each of the following hazards on a scale of 1 (high concern) to 3 (no concern) indicating the level of threat each presents to your neighborhood or home. *

	1-High Concern	2-Some Concern	3-No Concern
Flooding			
Hurricane/Tropical Storm			
Severe Storm			
Wildfire			
Erosion			
Extreme Heat			
Drought			
Sinkholes			
Winter Storm/Freeze			
Cyber Attack			
Hazardous Materials			
Terrorism			
Public Health Hazards			


3. Please list any additional hazards that present a threat to your neighborhood or home.
4. Please specify any additional recommendations that you might have for Hernando County to improve identification, prioritization, and implementation of hazard mitigation actions (i.e. retrofit infrastructure, upgrade building codes)?
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CONNECT
ACCESSIBILITY
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Appendix D

Hold for Adoption Resolution

Appendix C

Adoption Resolution