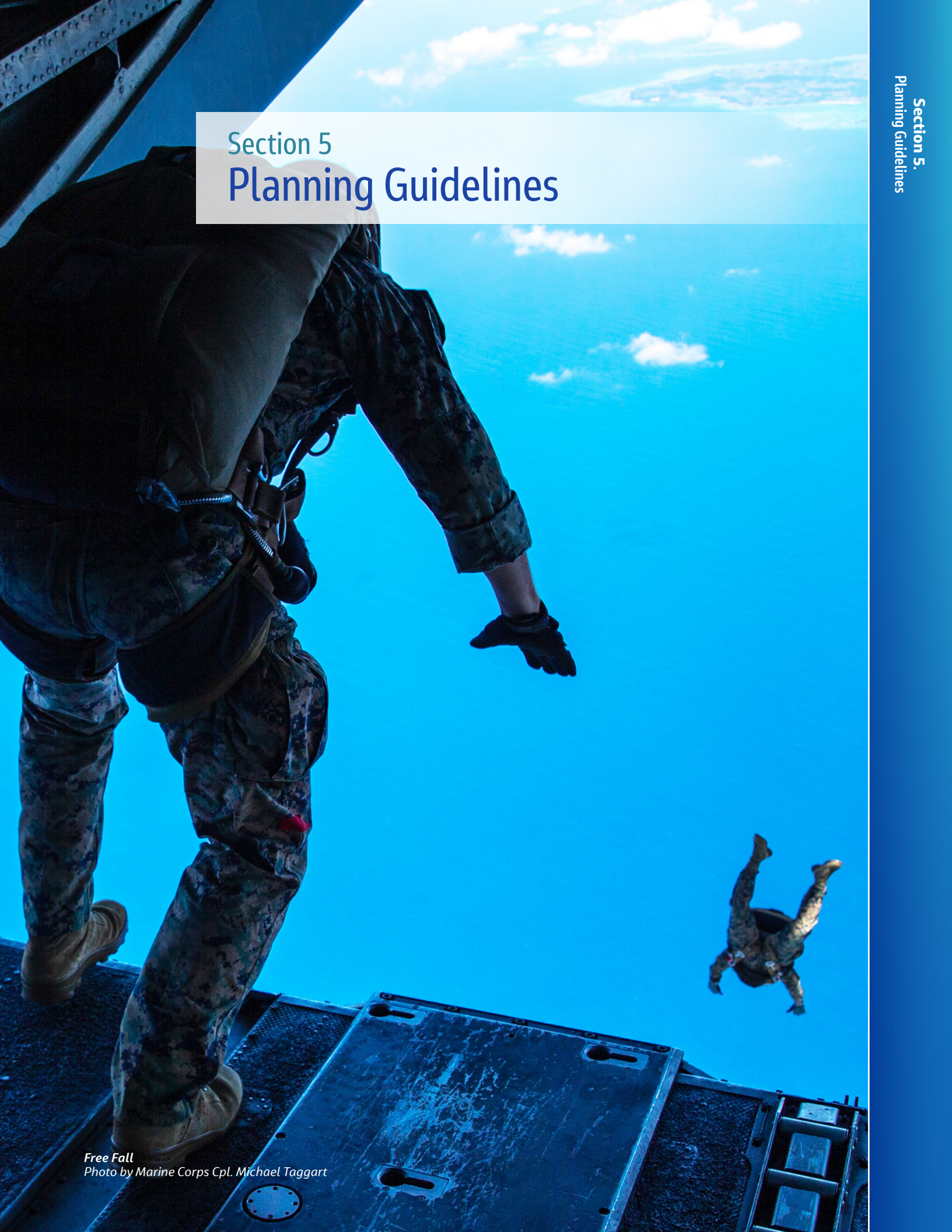


## Section 5 Planning Guidelines

*Free Fall*  
Photo by Marine Corps Cpl. Michael Taggart



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# Section 5 Planning Guidelines

## Identification of Primary Threats to Mission Assurance

As shown in Figure 5-1, the Planning Guidelines for the adaptation strategy of each installation was based on the results of the vulnerability assessment. The primary threats are those which the assessment characterized as regional and study area hazards with a high risk of occurrence and to which the mission critical assets are vulnerable. Because of the regionality of these threats, intervention opportunities can be derived from regional guidance and best practices.

## Identification of Intervention Opportunities for Natural Hazard Risk Mitigation and Adaptation

An intervention is a specific action or group of actions that are executed to mitigate risk. They are categorized as programs, policies, standards, or physical improvements. Interventions must be tailored to address the specific risk at the specific asset. While there are multiple interventions that can be used to address risk, the project evaluation methodology on Section 6 (page 6-4) should be used to identify the preferred solution.

All interventions should be identified based on the results of the vulnerability and needs assessments, as well as by the governing jurisdiction and the community in which it would be executed.

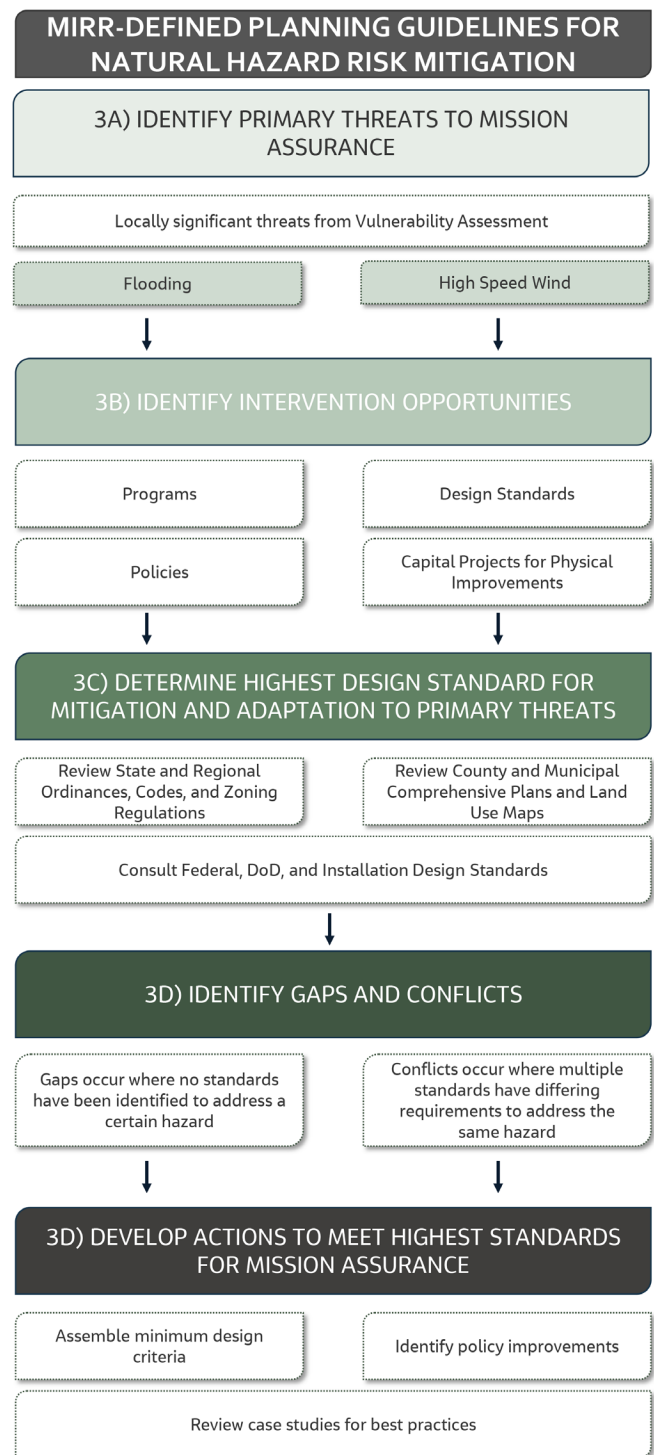
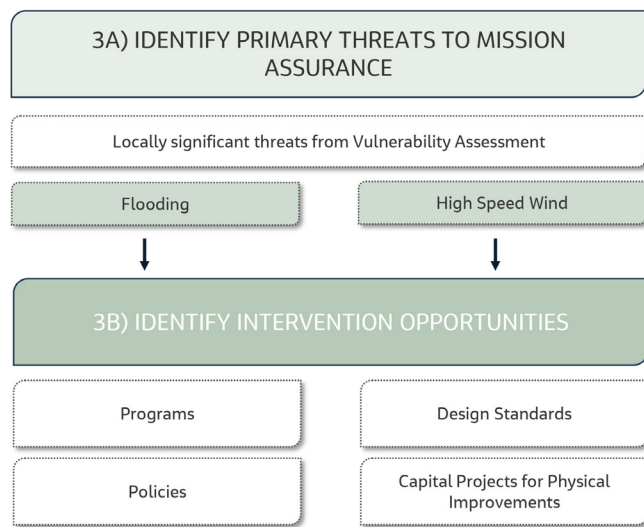


Figure 5-1. Planning Guidelines for Natural Hazard Risk Mitigation

## 5. PLANNING GUIDELINES



### Programs

Resilience projects can be undertaken as part of county or municipal capital improvement programs and plans, such as a stormwater management program. Program information can be found on county and municipal websites and are often mentioned in local government comprehensive plans and climate action plans. The SFWMD also undertakes resilience-related capital improvement programs.

### Policies

Policies are principles or actions that are adopted by governing entities. They can include ordinances or resolutions, such as municipal floodplain ordinances or a seawall height ordinance and can be used to enforce compliance with the most up-to-date design standards. The policies and reports that informed this MIRR document are discussed briefly in the following subsections. Additional resources can be found in Appendix A.

### Federal Policies and Reports

The Department of Defense, pursuant to Federal directive, has begun to incorporate resilience planning into DoD initiatives.

### Department of Defense Climate Risk Analysis

The analysis, published in 2021, reviews the security implications of climate hazards and risks to the DoD. It subsequently outlines how the DoD plans to incorporate climate change into its planning, strategy, and processes as well as products and expertise that can support those initiatives. The document represents an important step toward integrating climate considerations into DoD efforts to mitigate climate risks.

### 2020 Report to Congress: Resilient Defense Infrastructure and Military Installations Resiliency

This report discusses the challenges facing military installations, including balancing affordable resilience with acceptable risk and addressing future conditions in planning and design. The report then describes existing tools and processes that support resilience efforts for installations. The challenges described herein are addressed by other Federal policies and the recommendations noted in this MIRR.

### Department of the Navy Climate Action 2030

This plan describes the Navy's two climate action goals: to reduce the Navy's emissions and improve resilience. Specifically, the Navy commits to achieving energy resilience and nature-based resilience as well as developing resilient built and natural infrastructure.

### 2022 United States Army Climate Strategy

This document describes the Army's goals for climate change adaptation, including reducing greenhouse emissions and incorporating the security implications of climate change into strategy, planning, and other processes. To achieve those goals, the Army has three lines of effort, the first of which (LOE 1: Installations) is most directly applicable to the MIRR. The document describes the efforts needed to enhance installation resilience, including resilient energy and water supplies, carbon-pollution-free electricity, non-tactical fleet electrification, land management, and enhanced planning.

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## **Air Force Civil Engineer Severe Weather/Climate Hazard Screening and Risk Assessment Playbook**

This planning document provides a framework for civil engineers in the Air Force to assess hazards and assess risk for military installations.

## **NAVFAC Climate Change Installation Adaptation and Resilience Planning Handbook**

The handbook provides a methodology to help Navy planners incorporate climate change into their plans and projects. It can help planners understand how to best mitigate impacts to both built and natural infrastructure at the installation level.

## **Executive Order 13690 Future Flood Risk Management Standard**

The Future Flood Risk Management Standard requires that Federal agencies use one of three approaches to determine the flood elevation and flood hazard area for projects: the climate-informed science approach, which obtains elevation and hazard information from the best-available data and incorporates both current and future flood information; the freeboard value approach, which requires 2 feet of freeboard for non-critical assets and 3 feet of freeboard for critical assets; and the 500-year floodplain approach, which requires that the site be designed using information from the 0.2% annual chance flood event.

## **State and Regional Policies and Studies**

The Regional Climate Action Plan 3.0 (RCAP) shares guidance with up-to-date standards, strategies, and interventions for adapting to flooding and wind hazards in South Florida (Compact 2022). This regional guidance has been adopted by the Compact's four member counties since the RCAP's initial creation in 2012. These regional standards can be adopted by the South Florida installations through approval of design standard memos. These memos should be reviewed and approved by DoD branch leadership. To support this action, the MIRR team reviewed draft memos from HARB for alignment with local best practices, as was done after Hurricane Michael devastated Tyndall Air Force Base in northwest Florida in 2018.

The South Florida MIRR team reviewed documents from the Compact (including RCAP 3.0 and the Unified Sea Level Rise Projections [Compact 2020], the SFWMD (Resilience Plan and Level of Service Studies [SFWMD 2022]), and the State of Florida (including the Florida Building Code, Florida Administrative Code 9J-2.0256, Florida Adaptation Planning Guidebook, Vulnerability Assessment Scope of Work Guidance [FDEP 2022], and Sea Level Impact Projection Study Tool [FDEP 2023]). A selection of these documents are discussed briefly in the following subsections.

### **Florida Building Code**

The 2020 Florida Building Code provides minimum building requirements for new construction and reconstruction within the state. Section 1609 Wind Loads contains maps for each structure classification that show the ultimate design wind speeds for different areas throughout the state. The code also provides requirements for flood-resistant construction, including minimum elevation requirements in flood zones. The code requirements are informed by ASCE 7 and ASCE 24.

### **Florida Adaptation Planning Guidebook**

The purpose of the guidebook is to help Florida communities prepare for and adapt to the effects of climate change, with a focus on SLR, coastal erosion, and ecosystem changes. The document provides a roadmap for local governments on how to understand the context of their location, conduct vulnerability assessments, develop adaptation strategies to minimize vulnerability, and then implement those strategies.

### **Florida Department of Environmental Protection Standard Vulnerability Assessment: Scope of Work Guidance**

This document provides specific guidance and requirements that community vulnerability assessments must follow to be eligible for state funding. It details the processes for data collection, evaluating vulnerability by analyzing asset exposure and sensitivity, as well as those for additional non-required items, such as conducting public outreach meetings and coordination with the local mitigation strategy.

## 5. PLANNING GUIDELINES

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### **Florida Department of Economic Opportunity Statewide Vulnerability Assessment**

Per Florida Statute 380.093, FDEP has been tasked with developing a statewide flood vulnerability and sea level assessment to identify vulnerable areas within the state. FDEP has finalized its data set as of August 2023 and will complete the assessment by July 2024. The assessment will identify infrastructure and communities with flood and SLR vulnerabilities.

### **FDOT Technical Memorandum: Risk Assessment on SIS Facilities**

This report, prepared for FDOT by CDM Smith and Cambridge Systematics, Inc., details state roads most impacted by flooding coming from SLR and storm surge. Affected assets within the MIRR study area include portions of US Highway 1 in Miami-Dade and Monroe Counties.

### **Southeast Florida Regional Climate Action Plan 3.0**

The Southeast Florida Regional Climate Compact developed the third version of its climate action plan to provide a framework for southeastern communities to coordinate their adaptation efforts. The plan focuses on a variety of different focus areas, such as energy, natural systems, emergency management, and water, and provides goals, recommendations, and supporting strategies for each.

### **Southeast Florida Regional Climate Change Compact Unified Sea Level Rise Projection (County and Municipal Adoption)**

Updated in 2019, the Unified Sea Level Rise Projection provides updated sea level data for the Palm Beach, Broward, Miami-Dade, and Monroe Counties. The data incorporates and compares the Intergovernmental Panel on Climate Change median global projection, the NOAA intermediate high, the NOAA high, and the NOAA extreme sea level datums on the decadal scale up to 2120. It also compares the most recent data to previous projections; this comparison yields significant differences between the same projections. This shows the importance of using the most recent data.

### **USACE South Atlantic Coastal Study**

The South Atlantic Coastal Study conducted a risk analysis for coastal regions within Mississippi, Alabama, Florida, Georgia, South Carolina, and North Carolina, and provides recommendations for reducing flood risk in those regions. Recommendations include projects and studies, such as the Miami-Dade Back Bay Study.

### **United States Army Corps of Engineers (USACE) Coastal Storm Risk Management Feasibility Studies (Miami-Dade County and Monroe County)**

The Coastal Storm Risk Management (CSRSM) Studies evaluate coastal storm risks and issues, such as erosion and wave attack, in Miami-Dade and Monroe Counties. The Miami-Dade CSRSM Study provides a plan for flood protection for the region between the Bakers Haulover Inlet and Government Cut in Biscayne Bay.

### **USACE Central & South Florida Flood Control Project**

The Central and Southern Florida System Section 216 Flood Resiliency Study, conducted by the USACE, will identify areas within Broward and Miami watersheds that most require flood risk reduction.

### **Resilient305 Strategy**

This strategy is the comprehensive resilience strategy for greater Miami and the beaches. The plan has places, people, and pathways actions, through which it works to enhance the resilience of the built environment, improve the lives of residents, and bring together different entities to achieve its goals. As of the Year 1 Update, there are 59 total actions, 53 of which are in progress.

### **Local (County and Municipal) Comprehensive Plans, Ordinances, Building Codes, and Land Use Maps**

In South Florida, local climate strategies and plans are being developed in alignment with the standards established in the RCAP 3.0. Relevant local plans documenting these more stringent standards may include climate action plans, SLR strategies, transportation master

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plans, transportation studies, stormwater master plans, mitigation strategies, resilience plans, comprehensive plans, zoning ordinances, and flood ordinances. Plans for Broward County, Miami-Dade County, and Monroe County, along with those of the municipalities associated with the installations, are provided in the following subsections..

### **Broward County and City of Dania Beach**

As a member of the Southeast Regional Climate Compact, Broward County has extensive climate planning reflected in its policies and ordinances. Documentation incorporating climate change includes:

- Broward County Climate Action Plan
- Broward County Comprehensive Plan and Future Land Use Plan
- Broward County Enhanced Local Mitigation Strategy
- Broward MPO Commitment 2045 Metropolitan Transportation Plan & Resiliency Framework
- Broward County Recovery Plan
- City of Dania Beach Comprehensive Plan

### **Miami-Dade County, City of Doral, and City of Homestead**

Miami-Dade County is engaging in extensive resilience planning as well. Its policies and plans have helped cement it as one of the most forward-thinking communities working to address the effects of climate change. Policies that informed the South Florida MIRR adaptation strategies include:

- Miami-Dade County Climate Action Strategy
- Miami-Dade County Extreme Heat Action Plan
- Miami-Dade County Local Mitigation Strategy
- Miami-Dade County Sea Level Rise Strategy
- Miami-Dade Emergency Management Recovery Plan
- Miami-Dade Long Range Transportation Plan
- Miami-Dade County Comprehensive Development Master Plan

- City of Doral Comprehensive Master Plan
- City of Doral Low Impact Development Master Plan
- City of Doral Parks Master Plan
- City of Doral Transportation Master Plan
- City of Doral Complete Streets
- City of Homestead Comprehensive Plan
- South Miami-Dade County Flood Protection Level of Service Assessment for Current Conditions and Future and Future SLR Scenarios for the C-1, C-100, C-102, and C-103 Watersheds

### **Monroe County and City of Key West**

Monroe County and the City of Key West have been proactive in mitigating climate risks. Some of the plans and policies related to the South Florida MIRR include:

- City of Key West Adopted Comprehensive Plan
- Green Keys Sustainability Action Plan & Five Year Workplan
- Key West Forward
- Monroe County Climate Action Plan
- Monroe County Comprehensive Plan and Land Development Code
- Monroe County Flood Ordinance
- Monroe County Local Mitigation Strategy
- Monroe County Regional Resilience Plan
- Monroe County Roadway Vulnerability Study
- Monroe County US1 Master Plan



## 5. PLANNING GUIDELINES

### Design Standards

Design standards can be created by executive entities, such as state agencies or local government (for example, FDOT). While they may not have the weight of legislation or commission-enacted resolutions or ordinances behind it, they can still be required by groups with jurisdiction for compliance and funding purposes. Note that standards that are backed by legislation are easier to enforce.

### Capital Projects for Physical Improvements

Individual capital projects for physical improvements can be pursued for the explicit purpose of improving system resilience. Examples include a municipality elevating its roads or a utility hardening their facilities.

### Review of Current Design Standards for Interventions

As part of the development of adaptation strategies, existing design standards at the Federal, state, and local levels were reviewed to gain an understanding of the current best practices and commonalities among various standards. The Federal standards and guidelines reviewed by the South Florida MIRR Team include those of the DoD branches (U.S. Army, U.S. Navy, USAF, USMC) and other Federal bodies, such as the National Institute of Standards and Technology. Local design standards and adaptation strategies by Monroe, Miami-Dade, and Broward counties were reviewed as well as those of the cities of Dania Beach, Hollywood, Doral, Homestead, and Key West. In the development of the South Florida MIRR, the South Florida MIRR Team also reviewed documents prepared by the four-county Southeast Florida Regional Climate Change Compact, utility plans, and additional design standards related to climate change.

#### 3C) DETERMINE HIGHEST DESIGN STANDARD FOR MITIGATION AND ADAPTATION TO PRIMARY THREATS

Review State and Regional Ordinances, Codes, and Zoning Regulations

Review County and Municipal Comprehensive Plans and Land Use Maps

Consult Federal, DoD, and Installation Design Standards

### Determine the Highest Design Standard for Mitigation and Adaptation to Primary Threats

In South Florida, flooding and extreme wind are the primary hazards that present risk to mission assurance and for which local design standards have been developed for adaptation. These local sources have been identified as the best practices and industry-accepted standards within the boundaries of this MIRR. If these practices exceed Federal or state standards that the DoD follows, the MIRR project team will recommend the installations adopt them as their own requirements to build consistency for improvements both inside and outside of the installation.

### Consult Federal, DoD, and Installation-specific Design Standards

The following examples illustrate the application of the most stringent design standards to mitigate the primary natural hazards in South Florida. Design standards and adaptation guidelines reviewed in this category include directives and executive orders (EO13690 Future Flood Risk Management Standard), DoD guidance documents (Air Force Severe Weather/Climate Hazard Screening and Risk Assessment Playbook [USAF 2020]), and the UFC (High Performance and Sustainable Building Requirements and Civil Engineering [DoD 2022]).

### Design Standards for Identified Hazards with a High Risk of Occurrence

#### Flooding

Federal, state, and local design standards were reviewed for asset/building elevation and roadway elevation, relative to the current FEMA Flood Insurance Rate Map BFE, which represents the modeled flood elevation for the 100-year event or 1% annual chance flood. Flood standards should



be taken from their local context. For example, Key West and Miami Beach have different elevation standards because of differing present and future conditions.



*Flooding represents a high risk of occurrence in South Florida*

**Asset Elevation.** Design standards for elevating assets address either retrofitting of existing assets or minimum elevations for new assets. One example of asset elevation design standards is from Miami-Dade County's Water and Sewer Department's 2019 Design Guide for Flood Hardening for Wastewater Treatment Plants (Jacobs 2019), which uses a 50-year planning horizon for new assets.

**Roadway Elevation.** Roadway elevation design standards vary depending upon location. Roadway design standards from Key West and Miami Beach can be used for the installations in their respective regions.

### Extreme Wind

**Design Wind Speed.** After Hurricane Andrew in 1992, South Florida began to strengthen its building codes. The South Florida Building



*Extreme Wind Spurred Adoption of Higher Design Standards*

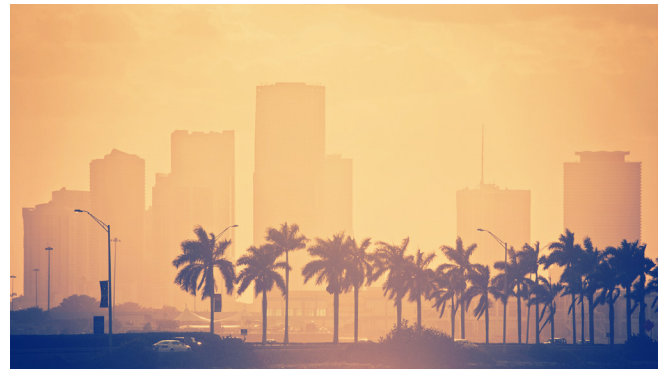
Code eventually became the state building code incorporating wind speed contour maps that are used throughout Florida to guide design standards for permitted construction activities. These maps are based on historical wind speed data. Regardless of the location, planning for wind speeds should be done with future wind speeds (which are anticipated to be greater than historical wind speeds) in mind and use the most stringent local or state design standards.

### Hazards with Moderate Risk of Occurrence

Other hazards that were not determined to be primary threats for the South Florida MIRR are briefly discussed below. Where local, regional, or state design standards were not available, national or other industry design standards were consulted as needed.

### With Identified Standards

Extreme heat was identified as a hazard with a moderate risk of occurrence. While there currently are no industry-wide quantitative methods for evaluating vulnerability to extreme heat, there are published standards that can assist with the creation of policy. The USMC uses the Wet Bulb, Globe Temperature Index (WBGT) to assess the effect of heat stress on people and uses color-coded flags (corresponding with WBGT ranges) to indicate the intensity of training on the installation for that day (USMC n.d.).



*Extreme Heat Has Published Standards for Policy Creation*

## 5. PLANNING GUIDELINES

At the local level, Miami-Dade County has released its *Extreme Heat Action Plan*, which identifies various strategies to achieve its goals of protecting people, cooling homes and critical public service and emergency response facilities, and cooling neighborhoods. The Heat Action Plan has a GIS webtool available that shows areas with high heat risk throughout the County (Miami-Dade County 2022).

Wildfire was identified as a hazard with a moderate risk of occurrence across the region. No local standards exist at the time of this project for its mitigation. However, standards from the national level and other states are available with recommended actions for risk mitigation. These include minimum design standards for building materials, defensible space around a structure, and land management.



*Wildfire Mitigation Can Be Addressed Through Proactive Land Management*

### Without Identified Standards

Other hazards, such as erosion, air quality, and saltwater corrosion, do not have similar quantitative methods of evaluation or associated standards. Adaptation strategies for these hazards can be obtained from best practices during the next phase of implementation and collaboration.



*Mission Execution in Extreme Weather*

## Identification of Gaps and Conflicts

While reviewing current design standards, potential gaps and conflicts should be identified. Gaps occur when there are threats for which there are no identified standards. If a gap was identified, it was acknowledged in the adaptation strategy and best practices provided and used. Conflicts occur when multiple standards have differing requirements or mandate different actions for the same threat. When this occurred, the most stringent design standard was adopted if the standard applies to improvements outside the installation perimeter. This is intended to ensure that all mission-dependent infrastructure meets a more stringent standard in support of mission assurance. If multiple actions are required to meet risk reduction objectives, all viable interventions were assessed during the adaptation strategy process (as described in Section 6, Adaptation Strategies and Projects).

### 3D) IDENTIFY GAPS AND CONFLICTS

Gaps occur where no standards have been identified to address a certain hazard

Conflicts occur where multiple standards have differing requirements to address the same hazard

## Development of Actions to Meet the Highest Standards for Mission Assurance

To provide long-term mission assurance through implementation of the most stringent design standards, a list of recommended actions was developed that describes the desired standards and any gaps between the desired standards and the regulatory standards required by the affected entities. These recommendations are meant to ensure that all entities are using the same forward-looking design standards, and as a result, all adaptation strategies will provide risk mitigation and resilience.

Based on the findings of this assessment, a list of recommended design standards was prepared through the following actions:

- Assemble minimum design criteria. For installations in the South Florida MIRR, the following criteria were used.
  - Design wind speeds – Section 1607 Florida Building Code
    - Variable, dependent upon the region.
  - Design flood elevations
    - Key West – City of Key West Sea Level Rise Policy
      - Critical infrastructure
        - Minimum design elevation = FEMA FIRM BFE + Freeboard + 30-Year SLR (Intermediate High)
      - Roadways
        - Minimum bottom of road base elevation for groundwater: seasonal high water elevation + 20-year SLR (intermediate high)

### 3D) DEVELOP ACTIONS TO MEET HIGHEST STANDARDS FOR MISSION ASSURANCE

Assemble minimum design criteria

Identify policy improvements

Review case studies for best practices

- Miami-Dade County Water and Sewer Department Sea Level Rise Guidelines
  - For new coastal facilities: Design Flood Elevation = Storm Surge + SLR + Rainfall Depth
  - For facility retrofits: BFE + SLR + Freeboard + Safety Factor (1 ft)
- It should be mentioned that a new flood supplement for ASCE 7-22 is anticipated to be released in 2023. The South Florida MIRR project team recommends that these standards should be adopted
- Seawall elevation – Use whichever is greater.
  - Broward County Policy 2.21.7
    - Minimum seawall height = 5 feet NAVD88
  - Key West Sea Level Rise Policy
    - Minimum top elevation of wall = seasonal high water elevation + 50-year SLR (intermediate high) + freeboard
- Identify policy improvements. Policy improvements are identified in Section 6, Adaptation Strategies and Projects.
- Review case studies for best practices.

The process for developing adaptation strategies as well as recommendations for the four installations within the South Florida MIRR is included in Section 6.



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