

Environmental & Energy Study Institute

The National Security – Climate Adaptation Nexus: *Mission Assurance Through Community Resilience*

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Mission Assurance Through Community Resilience Topics

1. The Why?
2. Vulnerability & risk examples
3. Adaptation approach
4. Partners
 - Florida Defense Alliance (FDA)
 - Office of Local Defense Community Cooperation (OLDCC) Military Installation Resilience Reviews (MIRRs)
5. MIRR objectives
6. How to determine risk?
7. Adaptation tools
8. Final thoughts



WHY? South Florida vulnerability assessment highlights

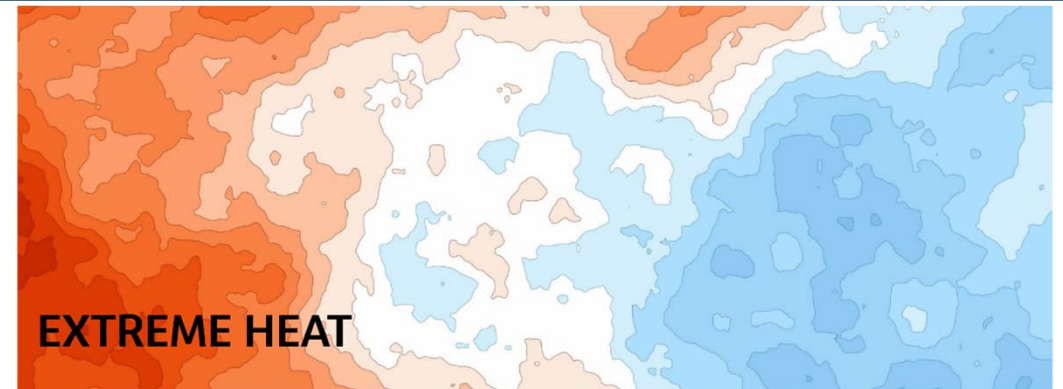


AGING INFRASTRUCTURE

History/ Likelihood of Occurrence/ Frequency	Relevance & Extent of Potential Impact
100% <i>Needs maintenance and replacement prior to life cycle end</i>	100% <i>Reliance on supporting infrastructure</i>

Installations and communities are reliant on infrastructure systems that are supplied and maintained by county, city, and private third-party providers

Infrastructure systems continue to expand as the capacity increases, creating both the need for continued maintenance of existing and new assets, and the replacement of components prior to the end of their life cycle.



EXTREME HEAT

History/ Likelihood of Occurrence/ Frequency	Relevance & Extent of Potential Impact
2-12 <i>Days Temperature exceeds 100 Degrees</i>	100% <i>Probability of High Demand on Infrastructure</i>

Climate change is projected to increase the number of days above 95°F by 20 to 30 days over the next 50 years.

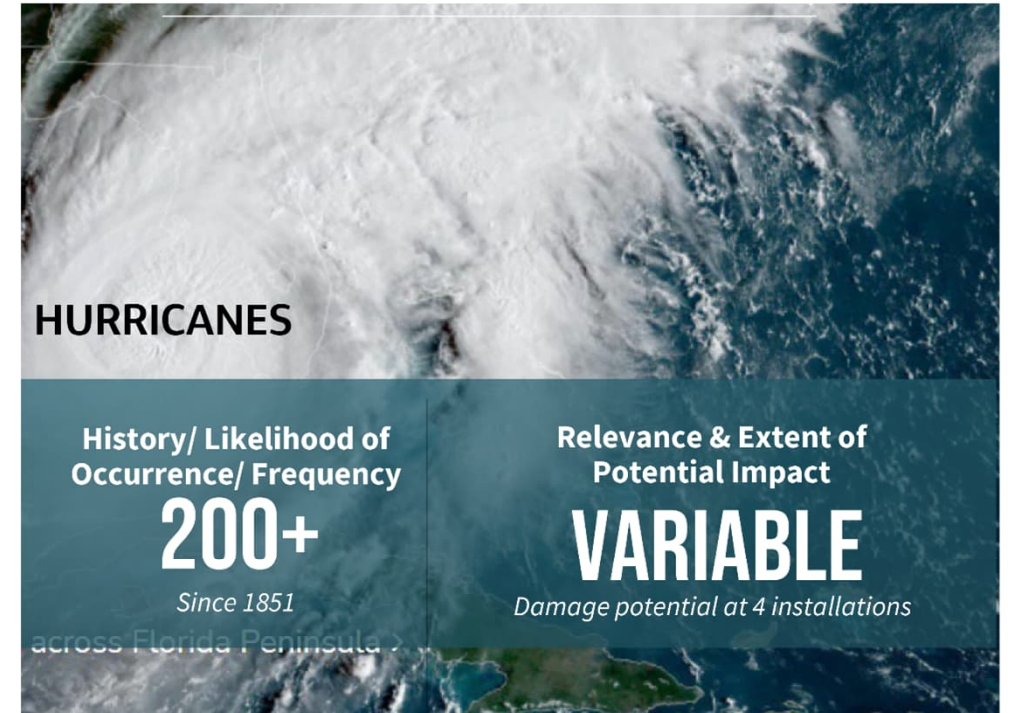
Extreme heat can cause health risks and fatalities for personnel exercising and working outdoors. Extreme heat above 120 °F may cause damage to roads or power cables and degrade military equipment, operations and training. Extreme heat can lead to higher energy demands which increases potential for power brownouts or disruption.

WHY? South Florida vulnerability assessment highlights



The housing crisis in America is worsening exponentially in South Florida

Lack of affordable housing was listed as a top priority for installations, counties, and cities in South Florida. Exacerbated by rising cost of living, staff are being priced out of the area, creating unmanageable commutes or moving away completely.



A hurricane is a tropical cyclone with sustained winds exceeding 74 mph. Hurricane season extends from June 1 to November 30 annually.

- Cat 1: Generally results in coastal flooding and tree damage.
- Cat 2: Winds may result in roof damage.
- Cat 3: Winds may cause damage to small buildings and may cause inland flooding.
- Cat 4: Can result in wall and roof failures in housing, major beach erosions and inland flooding.
- Cat 5: Can result in complete roof and small building failures, flooding of structures along the coast.

WHY? South Florida vulnerability assessment highlights



Development applications, even within natural areas providing valuable flood management, are expected to continue to South Florida.


Land management is the balance of maintaining and conserving natural infrastructure and compatible use development. Near installations, buffer zones should be established to prevent encroachment and security concerns at the perimeter. Once natural areas are developed, flood management and habitat is lost.



Lightning can result in injuries to personnel, fires, and damage to power infrastructure, equipment and vessels.

In 2019, Florida had 228 lightning events per square mile. Monroe County experiences 12 to 28 lightning strikes per square mile per year and has a 26% annual probability of lightning strikes that cause damage.

WHY? South Florida vulnerability assessment highlights




SEA LEVEL RISE, TIDAL FLOODING AND COMPOUND FLOODING

History/ Likelihood of Occurrence/ Frequency	Relevance & Extent of Potential Impact
<9 <i>Days per season</i>	NUISANCE <i>Flooding potential for 3 out of 4 Installations</i>

Sea level rise leads to compound flooding when rainfall, tidal flooding and surge flooding occur simultaneously.

Tidal flooding occurs today in coastal areas with elevations lower than 1.6 feet NAVD. Sea level rise also contributes to groundwater rise, seepage through the ground surface, degrading transportation assets and reducing capacity of stormwater systems. Sea level rise will eventually overtop and inundate coastal infrastructure if adaptation does not occur. Sea level rise also causes saltwater intrusion of inland freshwater/ potable water supplies.



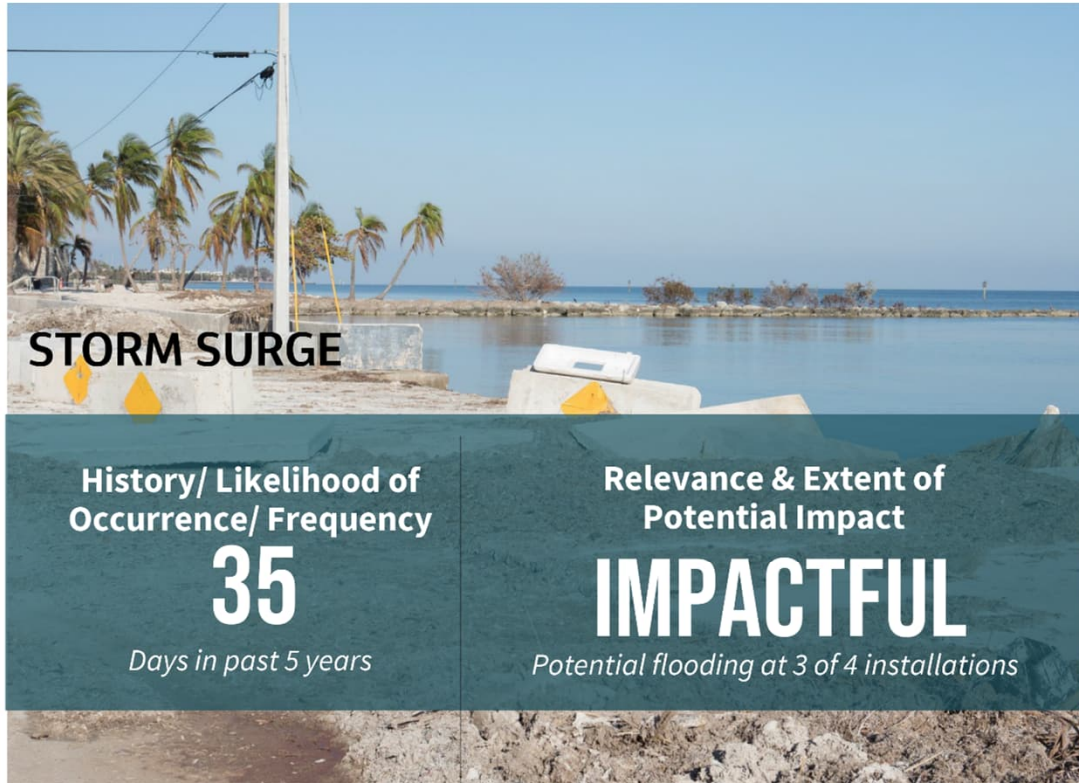
SEVERE THUNDERSTORMS & FUTURE PRECIPITATION

History/ Likelihood of Occurrence/ Frequency	Relevance & Extent of Potential Impact
40+ <i>Days per year</i>	IMPACTFUL <i>Flooding potential at 4 installations</i>

With climate change, severe thunderstorms are projected to increase in rainfall intensity and volume

SFOMF and NASKW are entirely within the 100-year floodplain. The areas surrounding SOUTHCOM and HARB are partially within the 100-year floodplain. Poses risk to drainage systems and roads

WHY? South Florida vulnerability assessment highlights



As hurricane magnitude increases, surge depths can reach over 9 feet in the project area.

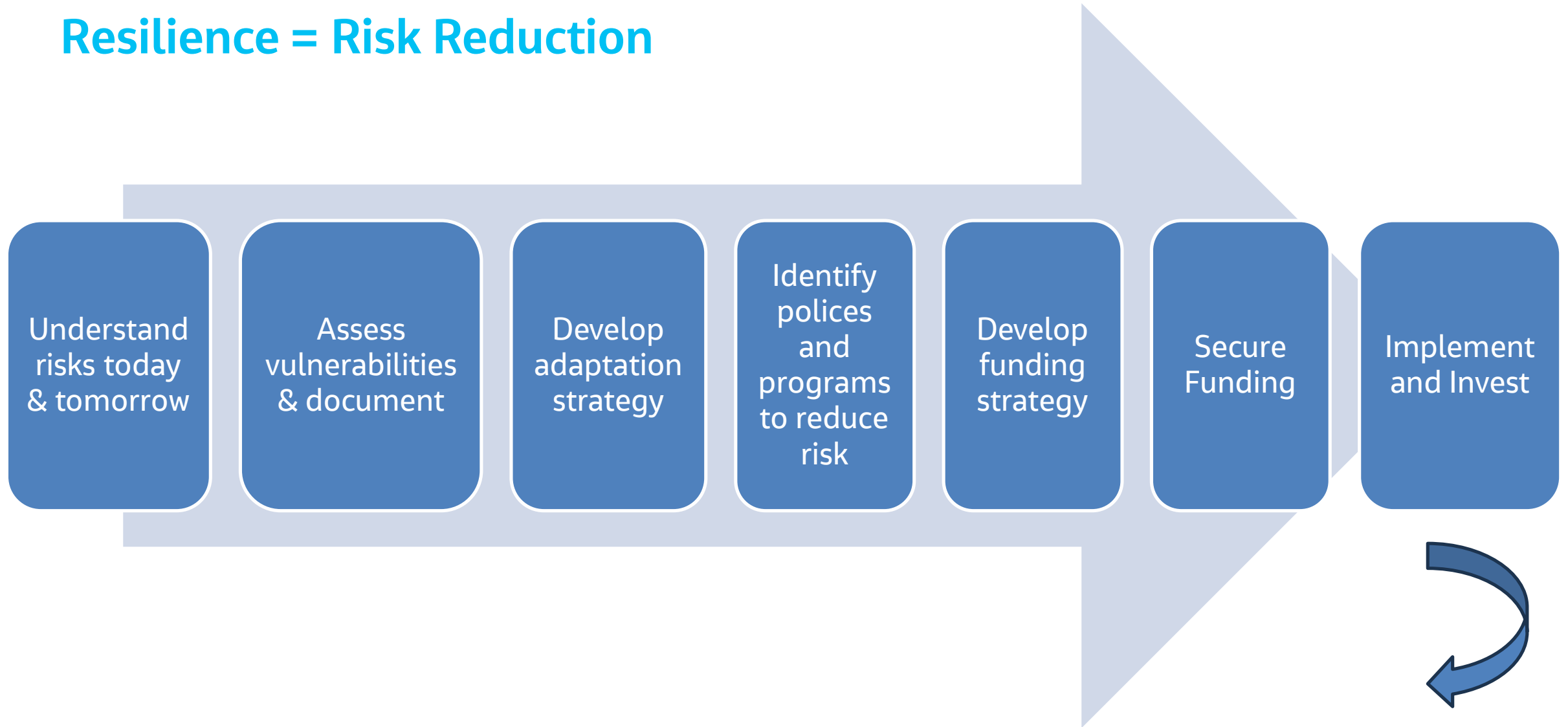
Storm surge can propagate inland through canals and cause inland flooding. According to the National Hurricane Center storm surge is produced by water being pushed toward the shore by the force of winds moving cyclonically around the storm. It is often the greatest threat to life and property from a hurricane event.



Future wind speeds are anticipated to increase by 2-11%.

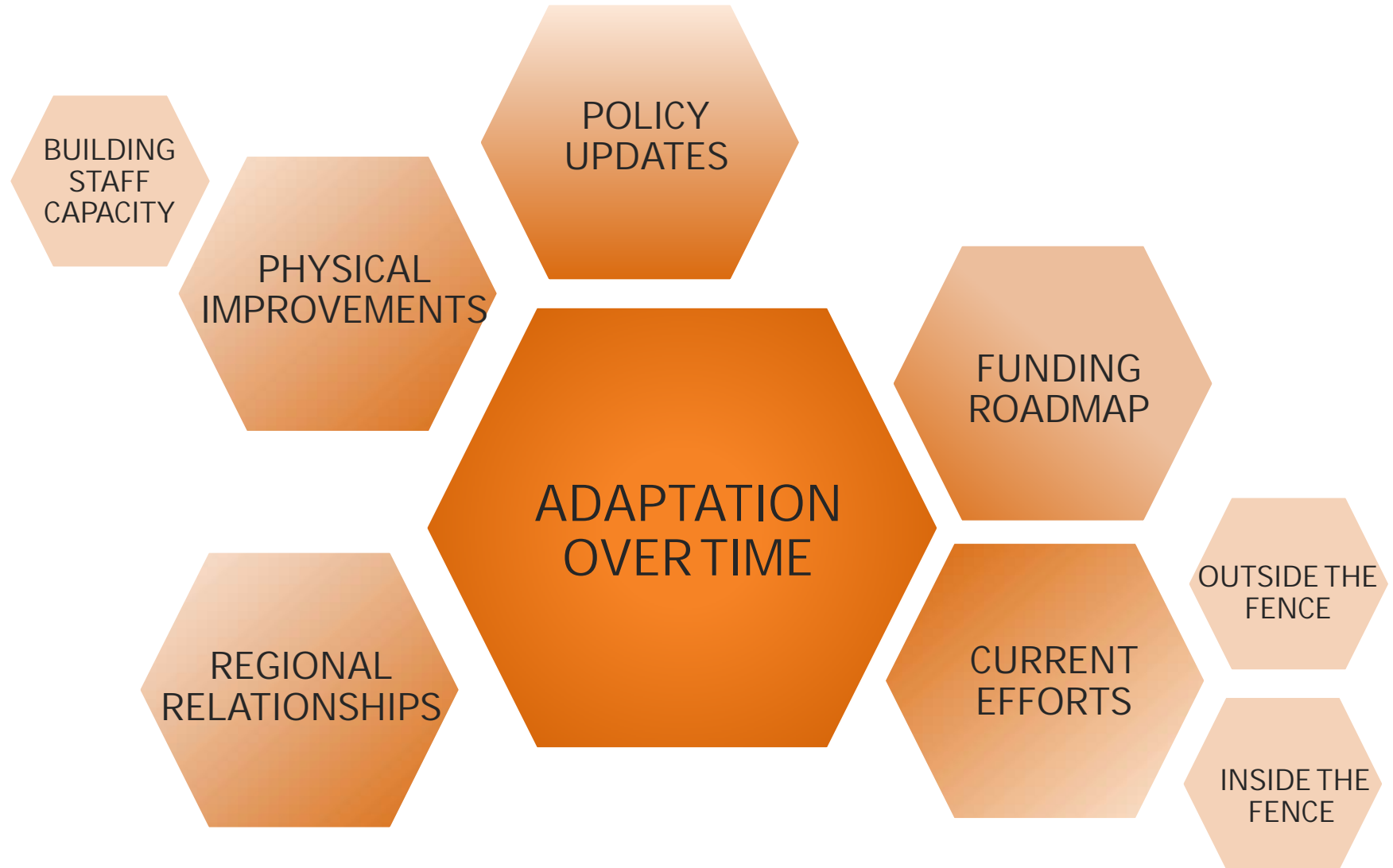
The high wind speeds and transport of debris turned projectiles within tornadoes causes property damage and loss of life. Strong winds can cause damage to trees, vehicles, and roofs. Most damage from thunderstorms results from straight-line winds which can gust at 100 miles per hour and damage as much infrastructure as a tornado.

Resilience = Risk Reduction

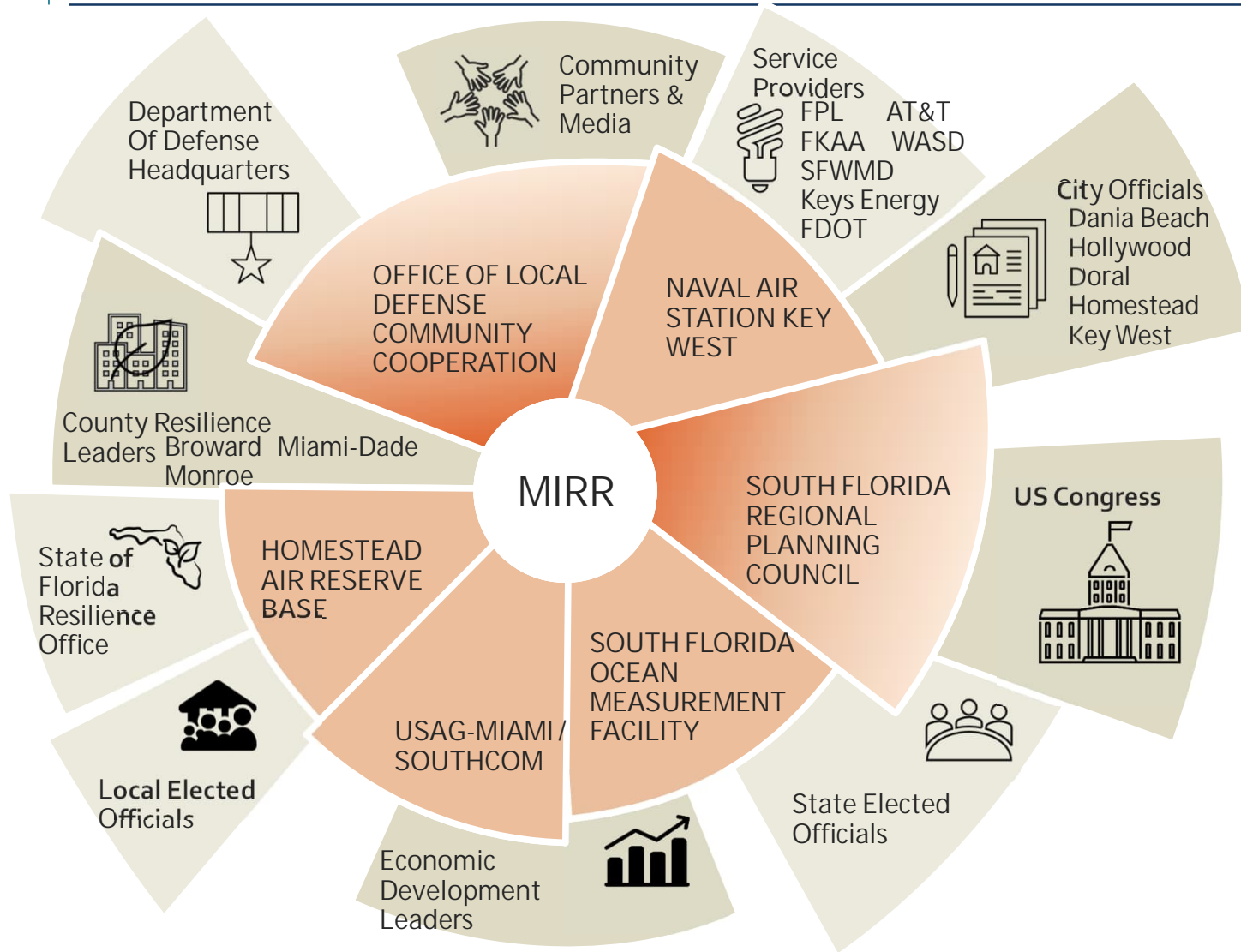


ADAPTATION: LAYERED APPROACH TO RESILIENCE

Multiple avenues are targeted to find complementary interventions that, when bundled together, can provide adaptation to vulnerabilities over time.



ADAPTATION: LEVERAGING LOCAL EFFORTS



Identify & Align Projects to Optimize Funding

- ❖ Capital Improvement Plans
- ❖ Comprehensive Development Master Plans
- ❖ Long Range Transportation Plans
- ❖ Local Mitigation Strategies
- ❖ Adaptation Studies
- ❖ Resilience Strategies & Plans

PARTNERS: OLDCC and FDA

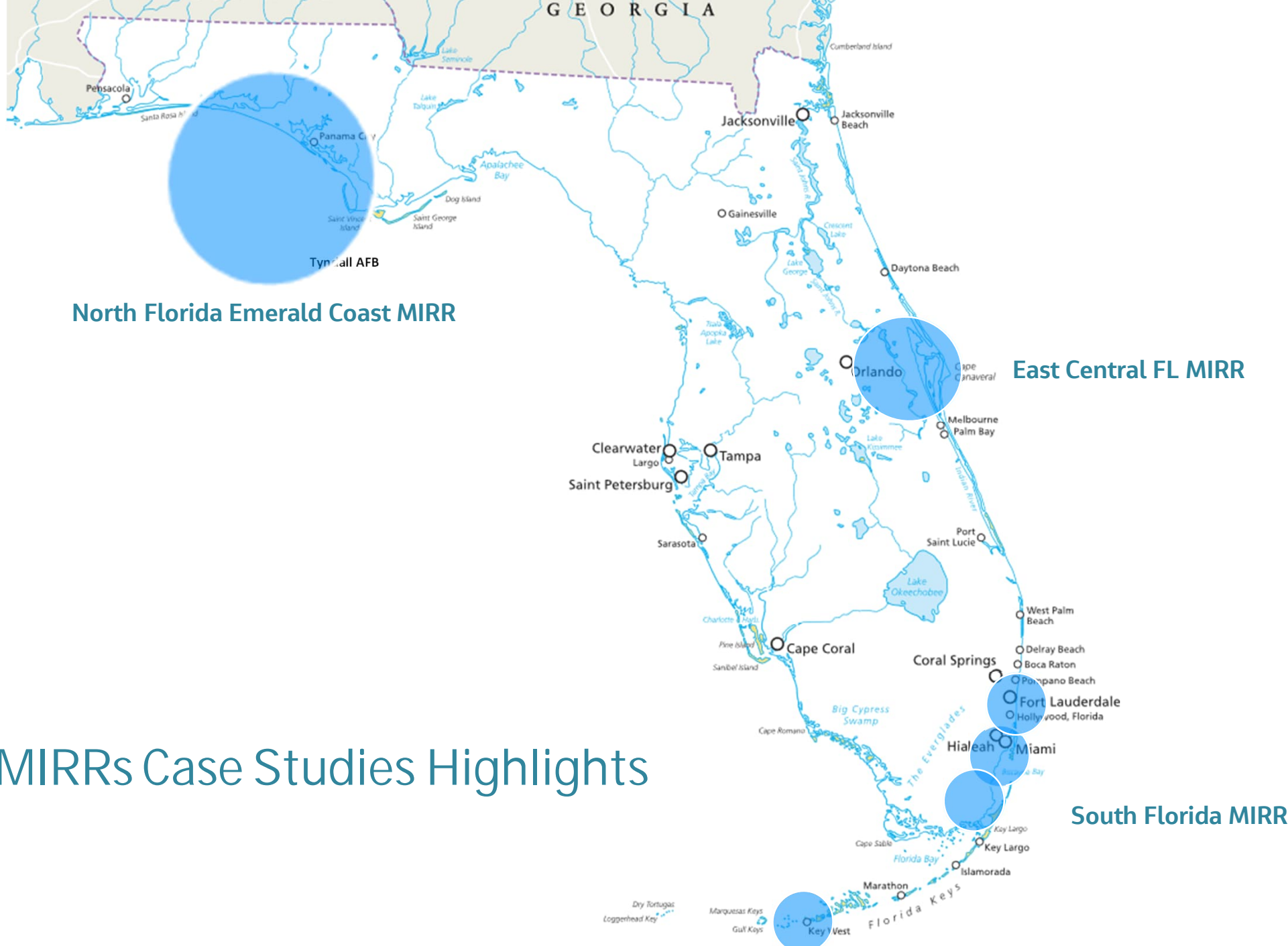
The Florida Defense Alliance is a grassroots consortium of representatives of defense-related organizations including government, defense industry, economic development organizations and other interested parties who come together in order to protect, promote and enhance the military value of Florida's installations and missions.



U.S. Department of Defense Office of Local Defense Community Cooperation

The U.S. Department of Defense Office of Local Defense Community Cooperation assists states and local governments to maximize support of the military mission. It provides technical and financial assistance to states, territories and communities that are invested in the defense mission.

Office of Local Defense Community Cooperation assistance supports the readiness and resilience of both defense installations and defense communities, a priority for the country's [National Defense Strategy](#).



North Florida Emerald Coast MIRR

East Central FL MIRR

South Florida MIRR

Florida MIRRs Case Studies Highlights

Military Installation Resilience Review Planning



Support Mission Assurance. Protect and preserve military readiness and defense capabilities through funded interventions.

Promote Resilience Communities. Improve the health, safety, and general welfare of those living and working at or near the installations through implementable, maintainable interventions.

Foster Regional Cooperation. Increase public awareness of the military missions through closer communications and interventions that are integrated with ongoing community resilience planning.

STEP 1: MIRR-DEFINED UNIFIED RESILIENCE ASSESSMENT METHODOLOGY



STEP 2: DATA COLLECTION AND VULNERABILITY ASSESSMENT



STEP 3: PLANNING GUIDELINES



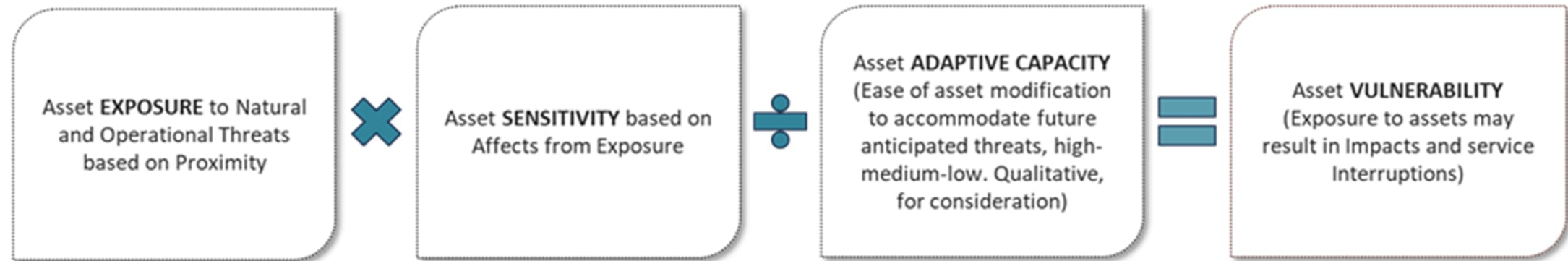
STEP 4: ADAPTATION STRATEGIES & PROJECT DEFINITION



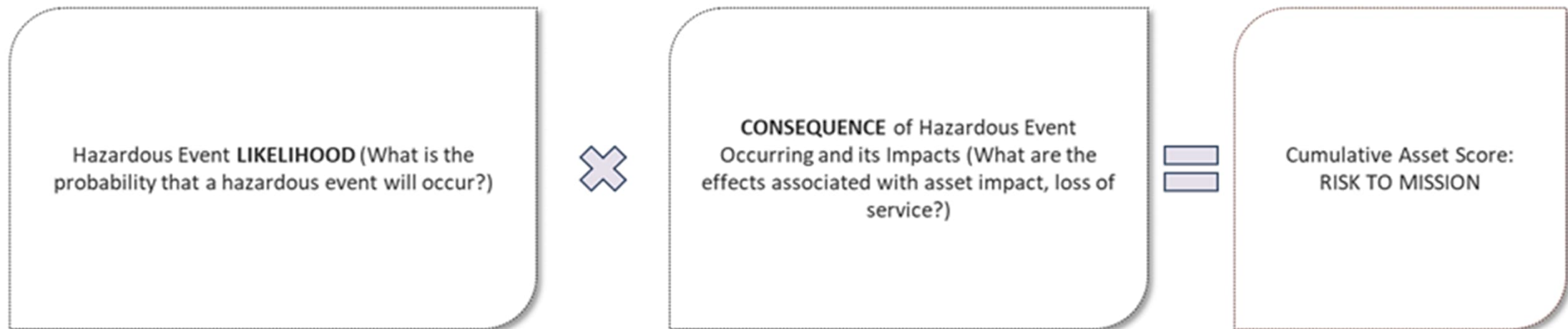
STEP 5: PROJECT TIMELINE & FUNDING OPTIONS

MISSION ASSURANCE THROUGH COMMUNITY RESILIENCE

DETERMINING VULNERABILITY & RISK



Once vulnerable assets are identified, a risk score is calculated for those vulnerable assets.



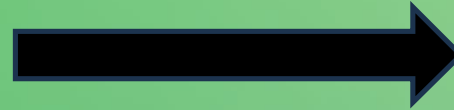
HOW WE BUILT IT: Emerald Coast, FL



Asset **EXPOSURE** to Natural and Operational Threats based on Proximity

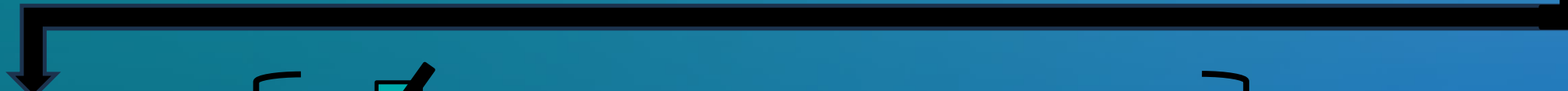


Asset **SENSITIVITY** based on Effects from Exposure



Asset **VULNERABILITY**
(Exposure to assets may result in Impacts and service Interruptions)

Once vulnerable assets are identified, a risk score is calculated for high-vulnerability assets.



High
Vulnerability
Asset



LIKELIHOOD of Hazard Occurring



CONSEQUENCE of Hazard Event Occurring

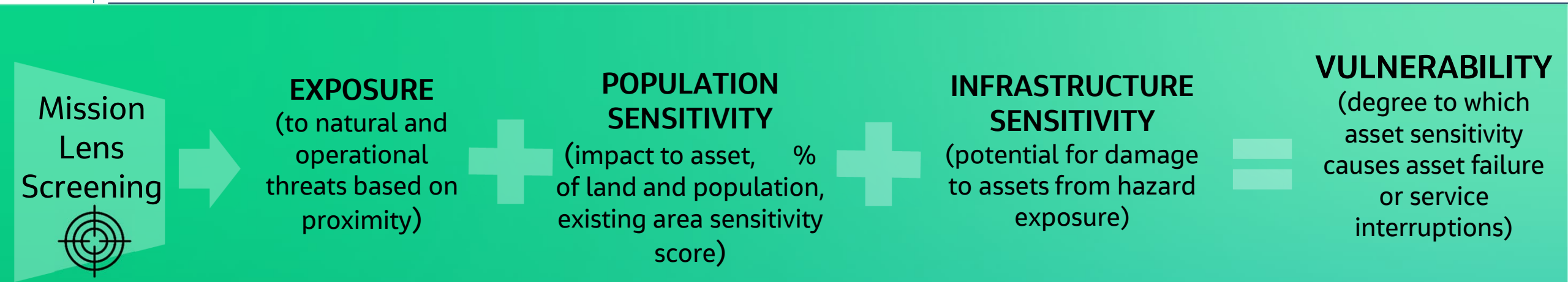


IMPACT ON MISSION



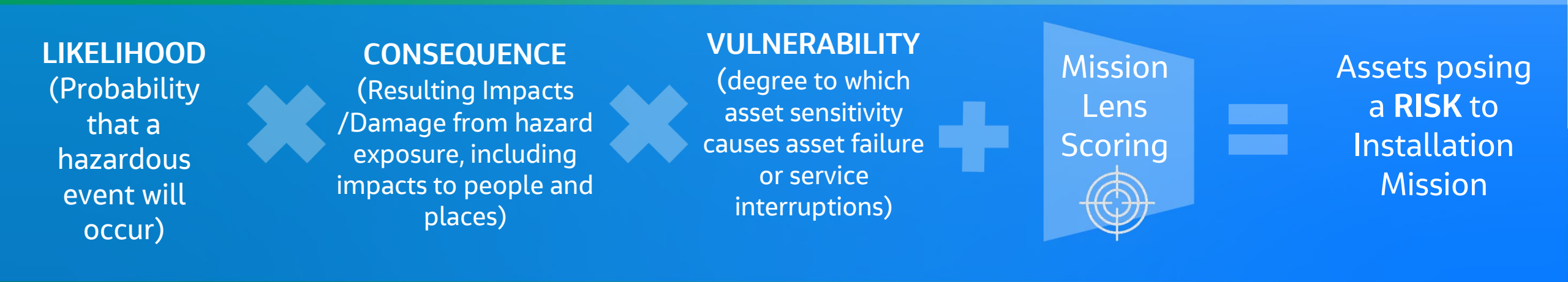
Cumulative Asset
Score: RISK TO
MISSION

HOW WE BUILT IT: East Central Florida

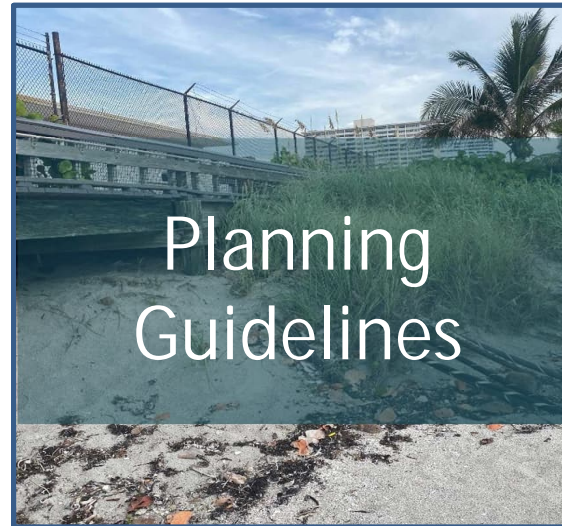
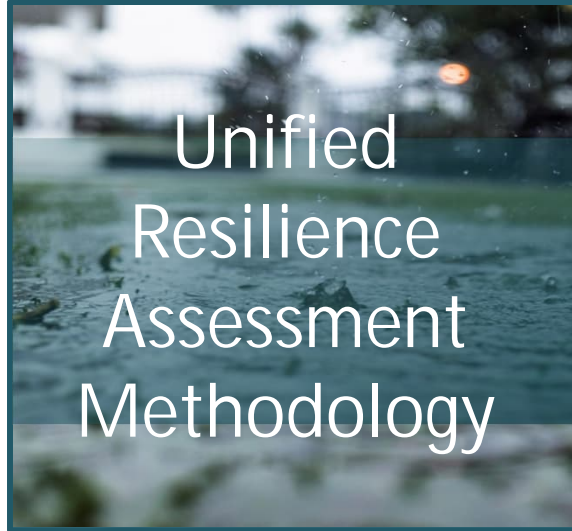


Adaptive capacity of assets is also considered qualitatively during evaluation process.

Once vulnerabilities are identified, a risk score is calculated for all critical assets.



ADAPTATION TOOLS



FINAL THOUGHTS

1. Climate change is a national security threat.
2. Climate vulnerabilities do not stay within geographic and/or political borders; therefore, working beyond borders is key.
3. Planning for future conditions and investing in a system's adaptive capacity reduces risk to military installations and the communities they call home.
4. The OLDCC MIRR program is an excellent vehicle to bring together community and military planners to assess risk and vulnerability and prepare adaptation strategies for investing in resilience. The program should be expanded beyond the Department of Defense to include other federal agencies, like DHS.
5. DoD should allow individual installations to follow local building and design codes when these have been strengthened to address local future climate conditions.

Thank you!

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