Cities Collaborating to Build Resilience and Leverage Funding

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As communities across the United States experience increasingly variable impacts of climate change, members of the Coastal Resilience Partnership (CRP) of Southeast Palm Beach County (shown in Figure 1) came together to proactively plan and prepare their communities for such impacts.

The state of Florida has always been on the front lines when it comes to weather-related risks, regularly practicing response and recovery tactics due to extreme events. In addition to the impacts the state is already experiencing, regulatory programs and organizations across the state are expecting communities to plan for the added threat of climate change, including (but not limited to):

Florida's Peril of Flood Act

Signed in 2015, this act requires that comprehensive plans include sea level rise as one of the causes of flood risk addressed in the section on "redevelopment principles, strategies, and engineering solutions."

Florida Resilient Coastlines Program

Through the FRCP, the Florida Department of Environmental Protection (FDEP) is working to ensure collaboration among coastal communities faced with the impacts of climate change. The Florida Resilient Coastlines Program (FRCP) coordinated resources to prepare Florida's coastal communities and habitats for the effects of climate change through technical assistance and financial support. The program is specifically focused on rising sea levels, increasingly complex flooding, erosion, and habitat shifts.

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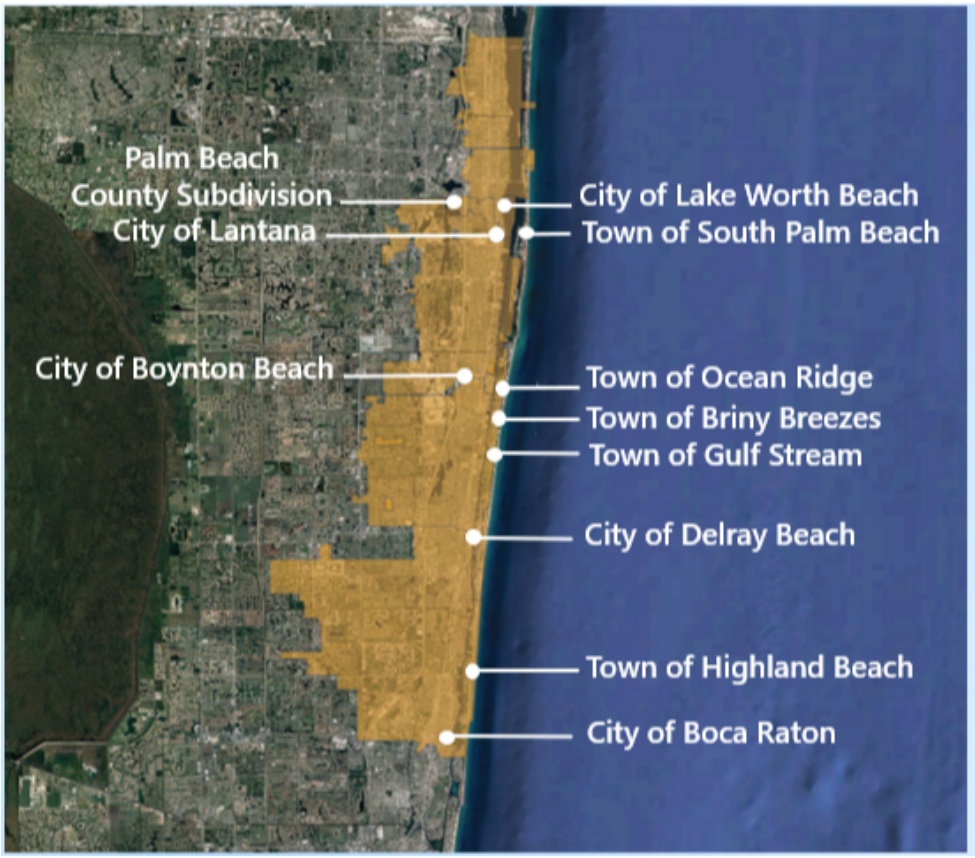

Figure 1. Members of Florida's Coastal Resilience Partnership of Southeast Palm Beach County

Resilient Florida Program

The Resilient Florida Program (RFP), signed into law in 2021, requires a coordinated approach to Florida's coastal and inland resilience, building upon the FRCP. The program enhances efforts to protect inland waterways, coastlines, and shores, which serve as natural defenses against sea level rise. The legislation will facilitate the largest investment in Florida's history to prepare communities for the impacts of climate change, including sea level rise, intensified storms, and flooding.

Southeast Florida Regional Climate Change Compact

The Southeast Florida Regional Climate Change Compact (SFRCCC or compact) is a collaboration among Broward, Miami-Dade, Monroe, and Palm Beach counties that began in 2010 and is focused on coordinating mitigation and adaptation activities across county lines. The compact represents a new form of regional climate governance that allows local governments to set the agenda for adaptation, while providing state and federal agencies access to technical assistance and support.

Each of these programs highlights the significant benefits of taking a regional approach to climate change planning. In fact, the FDEP distributed funds to FRCP, which then awarded the CRP its first grant with the purpose of supporting the development of a framework to assess climate vulnerability and prioritize adaptation strategies as a

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region. The CRP has subsequently been awarded two more grants (another one from FRCP and one from the RFP) in support of the next phases of work.

The CRP utilized the grant to achieve Phase I of the adaptation planning process, develop a governance structure, and provide a framework for performing a regional climate change vulnerability assessment (CCVA).

Critical elements for this initial phase included:

- Identifying a preliminary list of key asset categories (people, property, water infrastructure, transportation infrastructure, natural assets, critical facilities, and economy).
- Identifying a preliminary list of climate change impacts affecting the asset categories (e.g., sea level rise, storm surge, precipitation, lightning, temperature, extreme winds, and wildfires).
- Performing a data inventory and gap analysis to understand the depth and breadth of data available in each community for assessing the exposure, sensitivity, and adaptive capacity of assets.
- Developing the CCVA methodology to be performed in the next phase.

Phase I Planning Actions

The CRP members began meeting formally in 2018 to proactively plan for implementing adaptive measures to:

- Withstand today's extreme weather events.
- Be responsive to legislation calling for jurisdictions to plan for impacts of climate change.
- Implement measures to prepare for future effects of sea level rise and further climate change.

Before moving forward with any projects, the CRP agreed to develop guiding principles to use when approaching this CCVA and related projects.

The seven guiding principles they agreed on are:

Partnership and Collaboration

Climate change and its impacts do not stop at municipal borders, and the adaptation of one community can be strengthened or weakened by actions in another. The CRP will work to coordinate climate-adaptation efforts across neighboring jurisdictions, consider public investments and initiatives, and examine opportunities for public-private partnerships.

Infrastructure and Built Environment

Strategies to protect the built environment should incorporate the best available climate science and projections from sources such as the SFRCCC. Climate projections and adaptation strategies will be based on a time horizon relevant to the lifespan and criticality of the asset(s) in question.

The CRP recognizes that adaptation should balance engineering solutions, including nature-based strategies with long-term planning strategies, and also including managed retreat. The CRP will identify and use adaptation action areas[1] to prioritize public investments and limit new development in areas most vulnerable to climate impacts.

Economy

Adapting to climate change is essential to the region's economy. Impacted sectors should be identified to mitigate economic losses and transition the labor force to growth sectors. Where economic development is appropriate, it should be accomplished in a manner that protects, maintains, and enhances coastal resources, the built environment, historic sites, and tourism. It should also respect local land development regulations and evolving private property rights jurisprudence.

Natural Environment

Policy development should consider climate change impacts based on the best available science and aim for the highest possible level of protection of natural resources, biodiversity, natural systems (ecosystems/habitats), and environmental quality. Strategies identified within the adaptation action areas will allow for green or planned open space, protect and possibly expand habitats, and reduce or mitigate sources of pollution.

Social Equity

Among other priorities, adaptation and resilience strategies should strive to protect human life, public and private property, and cultural resources from climate change impacts. Development and evaluation of such strategies should consider economic and social vulnerabilities and opportunities to avoid climate impacts that may disproportionately affect disadvantaged communities and populations.

Emergency Response

Emergency response plans and communication strategies should help municipalities prepare for and respond to major disruptions resulting from climate change impacts. The goal is maintaining and quickly recovering critical operations to reduce adverse effects on people, property, and the environment.

Communication

Stakeholder outreach and messaging about the CRP's work should be directed to all populations via social and traditional media. Outreach materials should include a basic introduction to the issues, description of potential responses, and discussion of potential impacts of a changing environment on services. Messaging should be science-based, nonpartisan, and transparent, with the aim of allowing stakeholders to make informed decisions.

After the CRP confirmed the guiding principles, it was decided to move forward with developing a formal governance structure and pursue the critical elements of the planning phase (as listed previously).

First Steps in Regional Planning: Collecting Background Information

The first step of any regional project is to understand what individual CRP members have already completed toward assessing their own vulnerability and resilience to climate change. This enables the team to build an understanding of what has been either completed or initiated to date, including what data have been collected. This task was initiated by distributing a "Report and Data Request" to the CRP steering committee members. The project team reviewed the

[1] While adaptation action areas are an optional designation within a local government's comprehensive plan for areas that experience coastal flooding (and are vulnerable to the related impacts of rising sea levels), they are important to consider since they are used to prioritize funding for infrastructure needs and adaptation planning.

existing plans and reports provided by each community and developed a matrix summarizing each item by community, title of the document/data, and the main goals of the report/plan/data collection. This information was then used to inform the data inventory for the CCVA.

Defining Critical Asset Categories and Climate Impacts

While the team assessed what has already been done across the CRP membership, the partnership met to confirm the preliminary lists of asset categories (critical facilities/services, economy, natural assets, people, property, transportation, and water) and climate change impacts (temperature, sea level rise, storm surge, precipitation, extreme winds, lightning, and wildfires) to be considered for inclusion in a CCVA. Defining these aspects allows the project team to run a proper data gap analysis and to understand what data are missing and needed in order to proceed with a CCVA.

Performing a Data Gap Analysis

As part of the request for existing plans, reports, and data, the project team also requested that CRP members provide geographic information system (GIS) data layers related to the selected asset categories, as well as identify additional priority information, such as known areas of king tide flooding, tourism, and economic development.

The team collected GIS data from CRP member communities with the following steps:

- Held introductory meeting with communities
- Identified specific community contacts for data collection
- Delivered data request
- Provided county map with areas for direct markup by members
- Communities identified areas of concern on the map
- Project team facilitated interactive data collection with ArcGIS online or via file transfer
- Final follow-up with community contacts to collect remaining data

The next step was to perform a data gap analysis, identifying data required for completing a CCVA that is missing from the inventory. This information informs recommendations relating to the approach for collecting any additional data needed to successfully complete the CCVA (Phase II) for the CRP's consideration.

To better understand the data gap analysis, it's important to note that the team encountered two issues affecting data collection and inventory. First, for security reasons, the water utilities in the larger cities are reluctant to share locational data of critical water infrastructure. Second, some of the smaller towns that participated in Phase I (e.g., Briny Breezes and South Palm Beach), do not have GIS data for the community assets in question. It's uncertain whether they will commit the resources to convert their information to GIS until they understand exactly what the CCVA will entail (Phase II).

For these reasons, the data gap analysis does not consist of a single "synthesized spatial dataset"; rather, the deliverable is composed of the following:

- An inventory of all GIS data collected to date.
- Maps showing examples of the types of (nonprotected) data collected.
- A map of "areas of concern" identified through anecdotal information provided by participants.
- A summary of missing data and additional needs for performing the CCVA.

Developing the CCVA Framework for Phase II

A final element of Phase I was the development of a general framework for the CRP to follow in performing the CCVA in Phase II. The framework consists of seven steps (across three phases) adapted from various federal and state agency approaches (two of which have been completed in Phase I). By following the requirements of the federal and state approaches, the funding eligibility of recommended projects increases. The seven steps and three phases are shown in Figure 2.

Figure 2. General Framework for Climate Change Vulnerability Assessment

While the CRP consists of eleven jurisdictions, all of which participated in the initial planning process (Phase I), eight jurisdictions ultimately signed an interlocal agreement to complete the joint CCVA (Phase II), and they are now in Phase III of the process, updating the completed CCVA to become compliant with the Resilient Florida Program.

Summary

This article summarizes the evolution of the CRP and its governance structure, as well as the process it undertook to develop the framework and guiding principles necessary for performing a regional CCVA.

It also provides the background of regulatory programs and initiatives driving collaborative approaches to address climate change impacts and the next steps the CRP is taking that leverage and address these programs.