



MEMORANDUM

AGENDA ITEM #V.A 1.

DATE: JANUARY 9, 2012

TO: COUNCIL MEMBERS

FROM: STAFF

SUBJECT: SOUTHEAST FLORIDA REGIONAL CLIMATE CHANGE COMPACT PRESENTATION

Introduction

The Southeast Florida Regional Climate Change Compact represents a joint commitment of Broward, Miami-Dade, Palm Beach and Monroe Counties to partner in mitigating the causes and adapting to the consequences of climate change. The Compact was formalized following the 2009 Southeast Florida Climate Leadership Summit, when elected officials came together to discuss challenges and strategies for responding to the impacts of climate change. The Compact outlines a collaborative effort to participate in a Regional Climate Team toward the development of a Southeast Florida Regional Climate Change Action Plan.

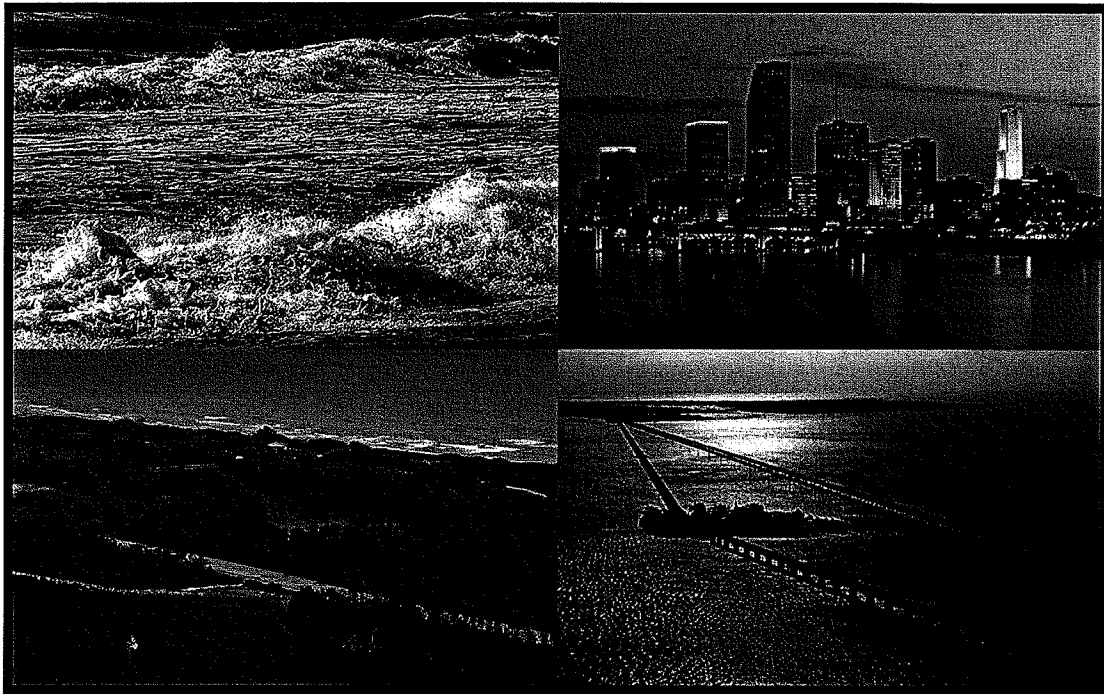
A valuable component of the Southeast Florida Regional Climate Change Compact (Compact) is the development of a Southeast Florida Regional Climate Change Action Plan. The Third Annual Regional Climate Leadership Summit was hosted by Monroe County in Key Largo, Florida on December 8 & 9, 2011, at which the Draft Action Plan was presented.

Dr. Jennifer Jurado, Director of Broward County's Natural Resources Planning and Management Division, and Ms. Susanne Torriente, Assistant City Manager for the City of Fort Lauderdale, will make a presentation on the draft Action Plan, which is attached.

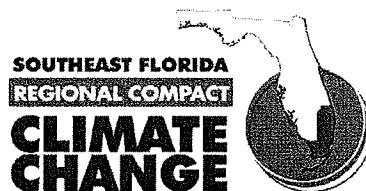
Recommendation

Information only.

A Region Responds to a Changing Climate



Southeast Florida Regional Climate Change Compact Counties Draft Regional Climate Change Action Plan



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ACKNOWLEDGEMENTS

The Draft Regional Climate Change Action Plan is the result of true collaboration – this entire plan and its supporting documents are the products of existing staff and existing resources from the various cooperating agencies. No additional public dollars were dedicated to this effort. The Compact was forged during one of the most difficult economic times facing the nation and facing local governments in particular. We came together with purpose and quickly realized the value and success of sharing resources and information. Competitors became collaborators. At this time when governments are pressured to do more with less, this effort facilitated information sharing at a new level. We developed this regional road map that will lead to better informed decision making over the next few years. Appendix I has a full list of the partners that helped bring this Draft Regional Climate Action Plan to fruition.

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I. Executive Summary

Welcome to the first Southeast Florida Regional Climate Change Action Plan. The Southeast Florida Regional Climate Compact (Compact), a unique and collaborative effort among Broward, Miami-Dade, Monroe and Palm Beach Counties, their municipalities and partners, has worked over the past two years to develop this plan with an initial five-year horizon. The plan is a critical milestone of the Compact, entered into by Broward, Miami-Dade, Monroe, and Palm Beach Counties in January 2010. Much of the Compact's work up to this point has served to unite, organize, and assess our region through the lens of climate change in setting the stage for action. Specific accomplishments include the development of regionally-consistent methodologies for mapping sea-level rise impacts, assessing vulnerability, and understanding the sources of regional greenhouse gas emissions. Collectively, these work products provide the foundation for this Regional Climate Action Plan, which calls for concerted action in reducing greenhouse gas emissions and anticipating and adapting to regional and local impacts of a changing climate. The recommendations presented here aim to accomplish those aspirational goals while also serving to protect the assets of the region's unique quality of life and economy, guide future investments, and foster livable, sustainable and resilient communities.



The Compact was established with a strong recognition of the region's diversity and its commonalities. It accepted the varying degrees of progress in the areas of climate change adaptation and mitigation in order to inform, to improve and to advance regional planning efforts together. This Regional Climate Action Plan too recognizes the diversity of Southeast Florida, yet provides the common framework for **Sustainable Community and Transportation**

Planning to be aligned across the region, as implemented. Inevitably this will occur at various stages and varying degrees, but with the benefit of working within a regional context. This is Southeast Florida, with all its uniqueness; it recognizes the need to protect and address our vulnerable **Water Supply, Management and Infrastructure** and preserve our fragile **Natural Systems and Agriculture** resources. The plan provides for steps to move towards resiliency and reduce emissions through exploring alternatives and decreasing our use of **Energy and Fuel**. The plan builds upon our strength as effective emergency responders and integrates climate change hazards in **Risk Reduction and Emergency Management** planning. Finally, the Regional Climate Action Plan creates a common vocabulary for public **Outreach and Public Policy** development to effectively communicate the steps from risk to resiliency with the general public, voters, elected officials and decision makers in Southeast Florida, the state and the nation.

The specific recommendations put forth in this plan were developed through a collaborative process involving nearly 100 subject matter experts, not only climate professionals, from the

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public and private sectors, area universities and not-for-profit organizations. These stakeholders brought to the table the knowledge of their “craft” as well as information on successful initiatives already underway locally or in other communities. Many of the recommendations build upon best practices sprinkled throughout our region, such as regional collaboration on transportation planning and land use regulations that foster walkable and healthy communities. Others delve into “new” frontiers in calling for the integration of climate change into planning and decision making processes in ways that no local government has yet implemented.

The overall objective was and remains to integrate climate adaptation and mitigation into existing systems and to develop a plan that can be implemented through existing local and regional organizations. It is in that spirit that this plan provides the common integrated framework for a stronger and more resilient Southeast Florida starting today and for tomorrow.

There are 100 action items detailed in the plan’s six goal areas to be accomplished over the next five years with annual reports to mark progress. The policy recommendations will be implemented through several approaches including:

- the development of **policy guiding documents** by local and regional governing bodies;
- the development of **operational guidance documents**;
- the development of **consistent goals and measures** throughout the various governments in the region;
- a coordinated **multi-disciplinary outreach and education program**; and
- processes for **focused and prioritized investments**

Every organization in the region has a role to play in making Southeast Florida a resilient and sustainable community of communities.

II. Introduction and Background: Southeast Florida Regional Climate Change Compact as Guidance for Regional Policy and Planning

Welcome to the first Regional Climate Action Plan of the Southeast Florida Regional Climate Compact, a unique and collaborative effort among Broward, Miami-Dade, Monroe and Palm Beach Counties, their municipalities and partners.

Southeast Florida is considered one of the most vulnerable areas to climate change and sea level rise. In the spring of 2009, several Southeast Florida counties and cities were making the rounds in the halls of Congress to advocate to for climate policy. A great deal of work had been invested individually by each jurisdiction, however each had slightly different baseline emissions figures at different points of time and different sea level rise planning scenarios. The need for regional coordination became quite evident. With 5.6 million



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residents in the four counties as of the 2010 Census, exceeding the population of 30 states and representing 30 percent of Florida's population, there is an obvious and unique strength in the region's size and in numbers.

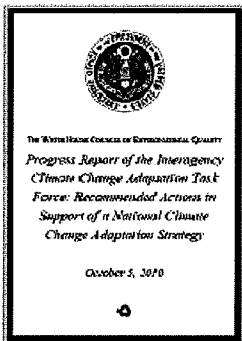
That fall, the four County Commissions held the 2009 Regional Climate Leadership Summit. This first Regional Summit led to the ratification of the Southeast Florida Climate Change Compact by January 2010, with unanimous votes within each County Commission. Since adoption, the Counties have assigned staff resources to support implementation of the compact under the direction of a Compact Steering Committee.

The Compact commitments include federal and state policy coordination on energy and climate related issues, assignment of staff and the development of this Southeast Florida Regional Climate Change Action Plan, and annual participation in regional summits to mark progress. The Compact set the charge to develop:

- A common baseline of greenhouse gas emissions for Southeast Florida;
- Common regional climate impacts planning scenarios incorporating sea-level rise and other potential impacts;
- Strategies for coordinated emission reductions throughout the built environment;
- Strategies for coordinated emission reductions from the transportation sector; and
- Strategies for coordinated emission reductions resulting from changes in local and regional land use.

The Compact paved the way for early work in 2010 to develop the unified regional baseline and sea level rise planning scenarios. Summaries of these work products are provided in Section IV.

III. Compact Awards and Recognitions



Since adoption, the Compact has won recognition through awards from ICLEI and the National Association of Counties, a requested white paper from the White House Domestic Policy Council, a request to host a listening session for the White House Council on Environmental Quality's - Interagency Adaptation Task Force, and specific references within the Task Force's Final Report to the President. Subsequent, federal agency engagement in the Compact has been highlighted in CEQ reports to the President, including the most recent Task Force report submitted in October 2011.

IV. Compact Work Completed

The adoption of the Regional Compact initiated an ambitious schedule requiring the completion of a robust body of work leading to this Regional Climate Action Plan. Since adoption in January 2010, the four Compact Counties have completed the following:

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a. Policy and Advocacy

Sections 1 – 4 of the Compact commits the Compact Counties to develop and advocate for joint federal and state climate change related policy positions. Specifically, the Compact calls for urging Congress to pass legislation that recognizes the unique vulnerabilities of Southeast Florida to climate change impacts especially sea level rise; allocates federal climate change funding based on vulnerabilities; designates areas of Southeast Florida as uniquely vulnerable and of federal interest for the purpose of securing enhanced levels of federal participation in regional adaptation projects; and supports strengthening policies relating to global climate change. Specific state policies adopted by the Compact Counties support the region's energy and climate security; renewable energy portfolio standard; and other emerging energy/climate issues that may be considered by a future Legislature.

Since ratification of the Compact, the Compact Counties have advanced policy and advocacy goals through joint positions, resolutions, letters and funding proposals and joint advocacy in Washington and Tallahassee. During the 211th and 212th sessions of the United States Congress, the partners requested appropriations for the Southeast Florida Climate Adaptation Pilot Project Proposal to fund regional modeling as the technical foundation for the Southeast Florida Regional Climate Action Plan. In May of 2010, the Compact Counties jointly advocated in Washington for federal climate legislation that included market-based carbon pricing, local government funding, and greater support for adaptation strategies in federal climate policies. On June 24, 2010, the Compact Counties jointly responded to the Deepwater Horizon Oil Spill that threatened the region's environment and economy by holding a well-attended press conference calling for comprehensive energy policy and protection of Florida's state and federal waters from the impact of oil drilling. In concert with local municipalities and Leagues of Cities, the event produced the Southeast Florida Response to Deepwater Horizon Oil Spill Letter to President Obama and joint resolutions in support for comprehensive climate legislation, restoration of damages due from the oil spill and for a ban on oil drilling within Florida's Territorial Waters.

In furtherance of the Compact's commitment to develop joint legislative policies, the Compact Counties adopted the 2011 and 2012 Southeast Florida State and Federal Energy and Climate Legislative Programs and advocated for their passage in Congress and in the Florida Legislature. The 2011 regional program included advocacy for the Pilot Project Proposal, recognition in law of a definition of "Adaptation Action Areas," greater recognition of adaptation as a critical climate strategy, and a State Renewable Energy Portfolio Standard of 20% renewable energy by 2020. The 2012 Compact Counties Legislative Program includes support for federal legislation to create and fund a national infrastructure bank or other new funding sources to assist local governments in adapting to the impacts of sea level rise, federal recognition of Adaptation Action Areas for the purpose of funding infrastructure vulnerable to sea level rise, and support for removing federal barriers to Property Assessed Clean Energy (PACE) and PACE-like programs to encourage energy efficiency and renewable energy improvements for residential homes and oppose oil drilling in federal waters on Florida's Outer Continental Shelf and the Everglades.

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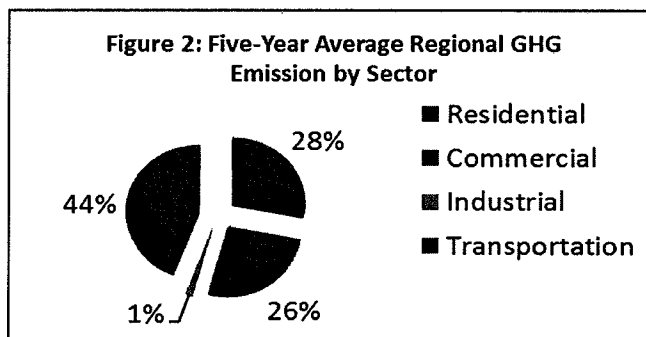
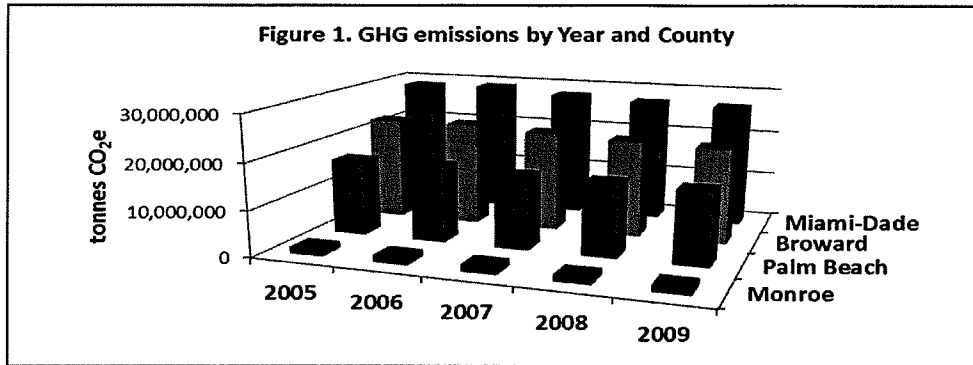
During the 2011 Florida Legislative Session, the Compact Counties successfully helped draft and led efforts to amend Florida law (163.3164(1), F.S. & 163.3177(6)(g)(10), F.S.) providing for a designation of "Adaptation Action Areas" that authorizes local governments to identify areas vulnerable to coastal flooding resulting from the impacts of sea level for the purpose of improving resiliency in areas subject to the impact of climate change. Immediately following changes to state law, a Members Letter was signed by several members of Florida's Congressional delegation requesting support for defining Adaptation Action Areas in federal law. Subsequent to the Members Letter, the Compact Counties' lobbyists and Delegation Members have requested the inclusion of language enabling at-risk, multi-county regions impacted by sea level rise to qualify for 2012 Energy and Water Appropriations funding via the Army Corps of Engineers.

On December 9, 2011, the Southeast Florida Regional Climate Action Plan was unveiled at the Third Annual Regional Climate Leadership Summit in Key Largo. The plan includes over 100 recommendations to implement actions over the next five years. Policy considerations of the plan include urging Congress to remove barriers to Property Assessed Clean Energy (PACE), recognize "Adaptation Action Areas" (AAA) through federal legislation and include support for AAA language for the purpose of prioritizing funding through the Army Corps of Engineers and the Environmental Protection Agency. In the upcoming years, the Compact Counties expect to build coalitions with municipalities, other county jurisdictions and the League of Cities and reach out to other regions in the country that are vulnerable to the impacts of sea level rise for the purpose of influencing state and national adaptation policy and funding. (See Outreach and Public Policy Section)

b. A Baseline of Greenhouse Gas Emissions for Southeast Florida

The Regional Compact called for the identification and quantification of Greenhouse Gas (GHG) emissions across Southeast Florida. Presented here are estimates of greenhouse gas emissions resulting from select activities within Southeast Florida during the five-year baseline period 2005 - 2009. The full Regional Inventory report is included as Appendix C to this document.

Southeast Florida peaked in total GHG emissions in 2006 and declined in the following three years, consistent with the performance of the national economy during this period (Figure 1). The relative emissions contribution of each County to the regional emissions reflects population and size. Regional emissions, across all sectors examined, were approximately 64.9 million metric tonnes of CO₂e in 2009, down from 69.7 MMTCO₂e in 2005. The five-year average of emissions (67.6 MMTCO₂e) shows that the transportation sector is the largest single source of regional emissions. The Residential and Commercial buildings sectors jointly contribute 54% of regional emission (Figure 2).



c. Unified Sea Level Rise Projection

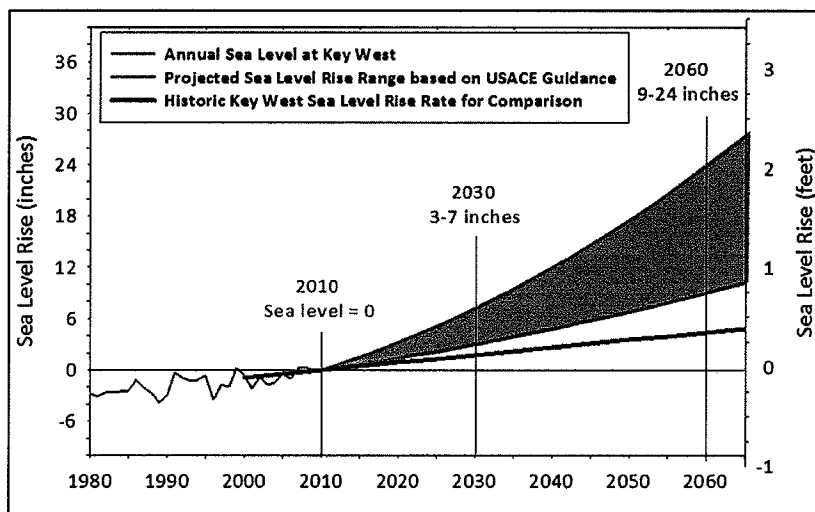
At the first Regional Climate Leadership Summit, the local diversity in sea level rise (SLR) projections was highlighted as a concern and a barrier to achieving regionally consistent adaptation policies and to demonstrating a coordinated local effort to higher political levels. Following the summit, the Compact Staff Steering Committee recognized the critical need to unify the existing local SLR projections to create a single regional SLR projection. Key participants in developing the existing projections and other local scientists specializing in the areas of sea level rise and climate change were invited to participate as the Regional Climate Change Compact Technical Ad hoc Work Group (Work Group). Their objective was to work toward developing a unified SLR projection for the Southeast Florida region for use by the Compact Counties and partners for planning purposes to aid in understanding potential vulnerabilities and to provide a basis for outlining adaptation strategies for the region.

Through a series of facilitated discussions, the Work Group reviewed the existing projections and the current scientific literature related to SLR with particular emphasis on the impact of accelerating ice melt on projections. The Work Group recommended that the SLR projection to be based on the U.S. Army Corps of Engineers (USACE) July 2009 Guidance Document until more definitive information on future SLR is available. The projection uses Key West tidal data from 1913-1999 as the foundation of the calculation and references the year 2010 as the starting date of the projection. Two key planning horizons are highlighted: 2030 when SLR is

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projected to be 3-7 inches and 2060 when SLR is projected to be 9-24 inches. . Based on the projection, a SLR of one foot is projected to occur between 2040 and 2070 with sea level continuing to rise into the future. Due to the rapidly changing body of scientific literature on this topic, the Work Group recommended that the projection should be reviewed and possibly revised four years from final approval by the Compact Staff Steering Committee and after the release of United Nations Intergovernmental Panel on Climate Change Fifth Assessment Report. "A Unified Sea Level Rise Projection for Southeast Florida" White Paper is available as Appendix D.



d. Inundation Mapping and Vulnerability Assessment of Areas at Risk by Sea Level Rise

Southeast Florida is highly vulnerable to sea level rise due to its peninsular geography and low topography. Mapping different sea level rise inundation scenarios helps to identify areas at potential risk and aids in planning for adaptation strategies. The Compact Inundation Mapping and Vulnerability Assessment Work Group was formed to perform a regional vulnerability assessment. Geographic Information System (GIS) practitioners, representing the Compact Counties as well as the South Florida Water Management District (SFWMD), local universities and federal agencies, worked with National Oceanographic and Atmospheric Administration (NOAA) Coastal Services Center (CSC) experts to understand inundation mapping methodologies, define the local challenges, review available topographic source data and create a consensus set of methods and criteria for inundation mapping. Additional discussions, surveys and workshops were used to develop planning parameters that would be part of the regional SLR vulnerability assessment. Using these commonly agreed parameters and data sources, the SFWMD produced inundation layers to represent areas potentially vulnerable to one, two and three-foot sea level rise scenarios. These layers were used by each of the four Compact counties to perform a vulnerability assessment for their jurisdiction.

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All of the Compact Counties are vulnerable to sea level rise. However, the degree and extent of potential impacts does vary across the region due to differences in land elevation and geomorphology. The southernmost counties are expected to experience the greatest direct impacts, Greater impacts occur in the southern counties with lessening impacts as one travels northward. Nearly 80% of the lands potentially affected regionally in the one foot scenario are conservation lands, especially coastal wetlands. Low lying natural systems made up of buttonwood, mangrove, scrub mangrove, and herbaceous coastal saline and freshwater wetlands are significantly impacted in all SLR scenarios. The upper estimate of taxable property values vulnerable in the one foot scenario is \$4 billion with values rising to over \$31 billion at the 3 foot scenario. The greater values reflected in the financial impacts are coastal residential properties with ocean access and high taxable value.

In terms of the critical infrastructure reviewed, projected inundation is often confined to marginal areas of the properties or impacting existing drainage infrastructure on site. This is generally true for the region's ports, airports, schools, landfills and hospitals. Monroe County is the exception with predicted building and infrastructure damage to these critical resources especially at the two and three foot sea level rise scenarios. Three of Monroe's four hospitals, 65% of schools and 71% of emergency shelters have property at elevations below sea level at the one foot scenario. Power plant properties in Miami-Dade and Broward as well as energy transmission facilities in Monroe begin to become inundated at the one foot scenario. While railroads are negligibly impacted, more than 81 miles of roadway from Miami-Dade through Palm Beach are impacted at the one foot scenario, increasing to more than 893 miles at the three foot scenario.

The intent of the GIS-based analysis conducted by the Compact was to provide a preliminary assessment of SLR vulnerabilities for regional planning purposes. This analysis did not include other possible impacts associated with SLR that require more complex modeling efforts, or indirect impacts, such as delineating what properties may become less accessible due to inundated roadways. Despite these limitations, the GIS-based vulnerability assessment conducted by the Compact serves to identify areas of potential concern for regional planning of adaptation strategies.

To prepare Southeast Florida for the likely impacts of sea level rise estimated by the Compact, cooperation is vital, not only among the Compact Counties, but also among the municipalities, local, regional, state and federal agencies serving the region. Strengthening this regional effort will be critical in order to coordinate public policies and adaptation measures that ensure the region's sustainable and economic growth.

V. Southeast Florida Regional Climate Action Plan Planning Process

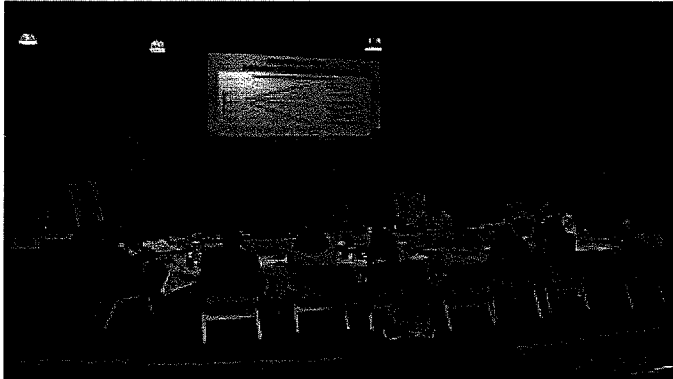
Members of the Compact Staff Steering Committee and representatives of numerous Federal and State agency partners met in Key Largo in February of 2011 for a workshop to review the work completed to date and plan a course of action going forward. Workshop participants

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brainstormed issues including the scope of the Regional Climate Action Plan, criteria to select priority issues, defining regional vs. local efforts, areas of expertise needed in issue area working groups and how best to split issue areas to be examined into logical, workable groupings. Also discussed were the timeline for the process and how to incorporate feedback from the Compact Staff Steering Committee and other stakeholders.

The Staff Steering Committee organized three workgroups to develop specific recommendations for reducing emissions and building climate resilience across the region. The three work groups, **Built Environment, Transportation and Land & Natural Systems** were designed to bring local experts with differing work experiences and areas of responsibility together to share knowledge and expertise. Each



work group consisted of more than thirty individuals from all parts of the four county region. Work group participants included representatives of academia, non-profits, the private sector and all levels of government. After several work sessions, surveys and much correspondence, draft recommendations were presented to the Staff Steering Committee at a July workshop. After review and comment, the Staff Steering Committee provided guidance to the three workgroups in finalizing the strategies to be included in the Regional Climate Action Plan and convened a “Super Committee” to address three cross-cutting issues that emerged separately from the work groups. The full extent of recommendations from each work group is attached as Appendix F.

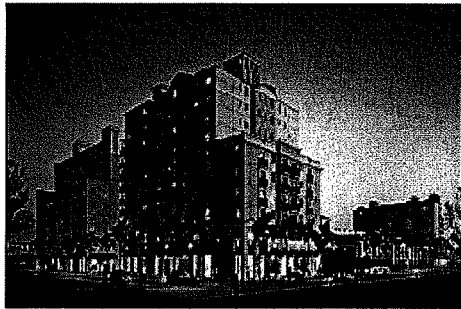
Structure of the Regional Climate Action Plan

To further review, consolidate, and categorize the numerous recommendations, a Super Committee was created consisting of key representatives from each Work Group, the Work Group chairs, and representative County staff. The Super Committee worked to consolidate the recommendations into six categories, including:

- Sustainable Communities and Transportation Planning
- Water Supply, Management and Infrastructure
- Natural Systems and Agriculture
- Energy and Fuel
- Risk Reduction and Emergency Management
- Outreach and Public Policy

The definition of each category and the recommendations are detailed as the Draft Regional Climate Action Plan.

VI. Actionable Recommendations



Sustainable Communities and Transportation Planning: With the establishment of a Unified Sea Level Rise Projection and the Preliminary Vulnerability Analysis, the picture of the likely future of our region is coming into focus. While the specific conditions at a given point in the future are impossible to predict, the range of potential future conditions has been defined based upon the best available science which includes an agreed upon level of uncertainty. This understanding of a likely future allows us to take action now to protect assets and invest wisely. As the science, monitoring, and modeling of impacts continue to be refined, this plan proposes that we designate areas uniquely vulnerable to climate impacts, including sea level rise, in order to focus adaptation planning, prioritize funding for infrastructure needs, and develop informed land use regulation. In 2011 the Florida Legislature amended state law to provide for a definition of Adaptation Action Areas as an optional component of local comprehensive plans for those low-lying coastal zones that are experiencing coastal flooding due to extreme high tides and storm surge, and which are more vulnerable to the impacts of rising sea level. It further specifies that local governments which adopt an Adaptation Action Area designation may consider policies within the coastal management element of the Local Comprehensive Plan to improve resilience to coastal flooding resulting from high-tide events, storm surge, flash floods, stormwater runoff, and related impacts of sea level rise. Subsequent to state legislative action, the concept of Adaptation Action Area designations moved to the federal level and members of Congress have since requested the definition of Adaptation Action Areas in federal law to provide for appropriations for adaptation planning and infrastructure needs in designated areas. Additionally, Congress is considering the "Water Infrastructure Resiliency and Sustainability Act of 2011" that creates a process to prioritize regions such as Adaptation Action Areas for the purpose of receiving infrastructure funding. It is a realistic to expect that future federal funding will be made available for designated Adaptation Action Areas at some point in the future. This section includes several recommendations addressing the designation and implementation of Adaptation Action Areas. The recognition of an Adaptation Action Area through designation or other appropriate policy tools is also expected to aide in focusing technical assistance and funding opportunities to areas most vulnerable.

The transportation sector contributes 45% of the region's greenhouse gas emissions, with the majority of trips taken for family and personal purposes in single occupancy vehicles. This highlights the importance of focusing on reducing the number of personal trips by

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providing more transportation choices. Recent studies estimate that the five “Ds” of compact development – density, diversity, design, destination and distance to transit – can lead to a 12 to 18 percent reduction in vehicle miles travelled (VMT) by 2050 (Urban Land Institute). The remaining recommendations in this section address compact development and call for an overall improved integration of land use and transportation planning with a focus on land use patterns, community, infrastructure, and transit design, all aimed at increasing the diversity of local and regional modes of transportation., The linear nature of Southeast Florida, with a historic sprawling growth pattern presents many opportunities to gain significant efficiencies from focusing development and services along key regional corridors. Over one hundred entities in the four-county region, including municipalities, county and state governments, Metropolitan Planning Organizations, and regional planning bodies, exercise governance over transportation planning, operation, and investment decisions. A continued and expanded collaborative approach to these activities will be a cornerstone to implementing these recommendations that not only serve to reduce GHG emissions but will realize cross-cutting benefits of more livable and desirable communities within our region.

- SP-1 Incorporate “Adaptation Action Area” designation, and other applicable provisions, into local Comprehensive Plans and regional planning documents to identify those areas deemed most vulnerable to sea level rise and other climate change impacts including extreme high tides, heavy local rain events, storm surge, or inadequate drainage systems.
- SP-2 Identify and designate “Adaptation Action Areas” (AAA) based on the results of vulnerability analyses. Inside AAA, local governments should identify ‘Adaptation Areas’ and ‘Restoration Areas’.
- SP-3 Adaptation Areas– designate areas within the AAA that include developed vulnerable land targeted for infrastructure improvements or modified land use and/or development practices in order to reduce risks and improve hazard mitigation. In these areas, the cost of retrofitting, building and maintaining infrastructure is very likely to be outweighed by the return in investment.
- SP-4 Restoration Areas- designate areas within the AAA that include vulnerable lands that may or may not be already developed and could include Coastal High Hazard areas and high storm surge areas. Local governments would place priority on the acquisition of land in these areas for environmental restoration, agriculture, conservation or recreational open space.
- SP-5 Growth Areas – areas outside of the AAA where growth is encouraged due to higher topographic elevations and the presence of existing transportation infrastructure. These designated areas should be developed with Urban Design guidelines that address character of urban place and provide a high quality pedestrian experience through landscaping, and the creation of public space.

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- SP-6 Incorporate Adaptation Action Area designation into local comprehensive plans and regional planning documents to identify those natural areas deemed most vulnerable to climate change impacts including changes in sea level and rainfall patterns.



- SP-7 Revise building codes, and land development regulations to discourage new development or post-disaster redevelopment in vulnerable areas and require vulnerability reduction measures for new construction and redevelopment such as additional hardening for increased resiliency of buildings and infrastructure for new development and redevelopment, particularly for those areas within Adaptation Action Areas.
- SP-8 Develop policies, strategies, and standards that will serve to reduce future risk and economic losses associated with sea level rise and flooding in these designated areas through infrastructure improvements and by directing future development and redevelopment to areas outside Adaptation Action Areas. This will also foster sustainable development, multi-modal transportation options, including transit, mixed use development, and the use of sustainable building techniques.
- SP-9 Focus transportation investments and service expansions on projects and strategies contributing to greenhouse gas emissions reductions and enhancing resilience to climate change.
- a. Continue to enhance and implement regionally coordinated transportation planning through the Regional Long Range Transportation Plan (RLRTP). Identify goals and objectives in the RLRTP which, as they are attained, reinforce the desired achievement of GHG emission reductions and enhanced resilience to climate change. Articulate the supportive role of these goals and objectives for emissions reductions and climate resiliency.
 - b. Give higher investment priority to and advocate for state and federal transportation infrastructure investments, programs and services that will reduce GHG emissions and enhance resiliency and adaptability to climate change. Performance standards for climate and related metrics, such as reduced VMT and increased mode split, should be incorporated in transportation plans and programs. Transportation planning should make full use of the Environmental Protection Agency's Guide to Sustainable Transportation Performance Measures (EPA 231-K-10-004, August 2011) for use of measures in major decision-making phases such as land use visioning, long-range transportation plans, corridor studies, programming, environmental review, and performance monitoring.
 - c. Incorporate evaluation criteria and processes to prioritize projects that meet RLRTP goals and objectives, into local and regional planning and programming processes, with an initial emphasis on evaluation criteria that reduce VMT and

increase use of transportation modes other than the personal vehicle. Projects that enhance economic vitality should also be given priority, such as projects and service expansions along transit-oriented corridors and those that improve connections to major airports and seaports.

- d. Prioritize the funding of studies addressing effective climate adaptation and mitigation strategies, particularly those addressing barriers to adaptation and assisting in integrating land use and transportation planning.
- e. Improve coordination among economic development, land-use/housing, transportation and water resource planning activities. Review local and regional planning and decision making processes to ensure a complementary approach towards developing and maintaining a transportation network, including for purposes of reducing VMT more transportation choices.

SP-10 Modify or develop new design standards for transportation infrastructure located in identified vulnerable areas to include asphalt concrete composition, bridge design, elevation, stormwater management. Include different pitches combined with stormwater design to effectively remove water from the roadway; Explore roadway materials that may be utilized in road construction that are more tolerant of extended periods of extreme temperatures.

SP-11 Require that new development and redevelopment in areas with existing and planned multimodal corridors that connect urban and other centers in the region be planned and designed to support walking, biking and transit use.

SP-12 Support effective planning and implementation of transit oriented developments (TODs)*, from both a local and regional scale, in coordination with effective planning and delivery of transit services, particularly premium transit services, to maximize ridership.

- a. Recognize that planning for TOD requires consideration of transit and land use issues at the system, corridor and station levels.
- b. Develop policies to streamline approval processes involving TODs.

**Transit oriented developments (TODs) are compact moderate to high intensity and density mixed use areas, within one-half mile of transit stations, designed to maximize walking trips and access to transit.*

SP-13 Introduce a new activity-based regional travel demand forecast model to directly simulate individual trip making and mode choice behaviors. Simulations done using the model will allow for robust tests of the effectiveness of policy alternatives

SP-14 Develop policies and land use ordinances to improve the movement of non-motorized modes through the adoption of best practice models including Complete Streets.

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- a. Develop policy, ordinances, guidelines, models and projects to accelerate implementation.
- b. Identify partners and resources to support training and the research into new techniques for transportation design and other professionals.

- SP-15 Modify local land use ordinances to encourage compact development patterns.
- a. Adopt form-based codes or hybrid codes that use physical form, rather than separation of land uses, as their organizing principle and that take into consideration the urban transect or context zones.
 - b. Consider regional implementation of rapid transit zones to maintain land use control around a station with multiple jurisdictions.

- SP-16 Consider the adoption of green neighborhood certification programs, such as LEED ND (Neighborhood Development) to guide decision making and development and to provide an incentive for better location, design, and construction of new residential, commercial, and mixed-use developments.

- SP-17 Develop policies to address new transportation infrastructure development in light of anticipated future climate impacts, such as consideration of future floodplain conditions and vulnerable areas which could require the rerouting of roads because of potential flood damage.

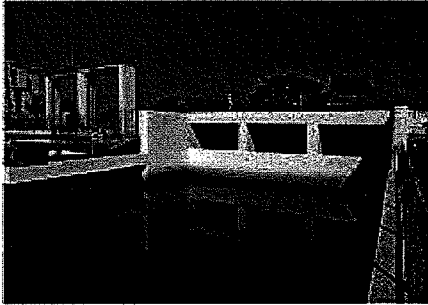
- SP-18 Coordinate initiatives of the Southeast Florida Regional Climate Change Compact with those of the Southeast Florida Regional Partnership, which is developing long-term (2060) Regional Vision and Blueprint for Economic Prosperity addressing the following Livability Principles:
- Provide more transportation choices
 - Promote equitable, affordable housing
 - Enhance economic competitiveness
 - Support existing communities
 - Coordinate policies and leverage investment
 - Value communities and neighborhoods
 - Enhance community resiliency to the impacts of Climate Change

Maximize the opportunities presented as the plan is developed (e.g., sharing data and analysis; participating in alternative future scenario planning; engaging a myriad of public, private and civic partners) and actively engage in plan implementation efforts.

Water Supply, Management and Infrastructure:

Climate change presents serious challenges for water managers with impacts on the quality and abundance of water supplies, water and wastewater infrastructure, and drainage and flood control operations. .

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Changing precipitation patterns and rates of evapotranspiration are expected to produce more frequent and severe droughts, while more intense storm events will tax water management systems. Impacts will be compounded by sea level rise with additional impacts to drinking water supplies due to saltwater intrusion as well as more sluggish water management operations resulting from increases in groundwater levels and discharge potential. Addressing the impacts of climate change will require: finding solutions to consistently maintain high quality and adequate water supplies for all local communities; strategies to reduce the cost and energy demands of alternative water supplies; consideration of future conditions with respect to the placement of infrastructure; and investments in new and upgraded infrastructure to maintain current levels of drainage and flood control . Additionally, sea level rise from climate change is threatening the Florida

Everglades, the backbone of our natural resource system, highlighting the urgent need for restoration of the Everglades with improved delivery and distribution of water flow to provide both natural resources and water supply benefits.

Given these challenges, it is essential to identify practical solutions today to help mitigate the impact of climate change on our future water supply. The Regional Climate Action Plan proposes recommendations to provide regionally coordinated water management plans that address stormwater use and disposal, traditional and alternative water supplies, wastewater disposal and reuse, water conservation measures, and continued support for Everglades restoration efforts.

A unified effort between government, businesses, and consumers is needed to implement near-term solutions and develop long-term strategies to mitigate adverse impacts of climate change on water supplies while developing new sources that add diversity to our water supplies, optimize the use of all water resources, and development of new sources less vulnerable to changing climate conditions. The challenge will be to implement these necessary projects without marked increases in energy consumption, a difficulty that underscores the value of conservation as priority strategy.. Policy changes, funding for infrastructure, development of alternative water supplies, and public education will all be necessary in order to make significant progress. The issues are vast and the investments to be great, effective response requiring the collaboration of the public, financial participation of state and federal governments , and the potential development of public-private partnerships.

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- WS-1 Inventory existing potable water supply delivery and collection systems, vulnerable wellfields, wastewater collection and/or treatment infrastructure, and stormwater drainage and treatment facilities; assess the potential impact from climate change of each component; and develop different climate change scenarios and adaptation strategies for high-risk utilities and/or infrastructure which may require replacement, reinforcement, or relocation to ensure the long term viability of the system.
- WS-2 Develop a saltwater intrusion baseline, utilize inundation mapping, saltwater intrusion models, and stormwater management models to identify areas and infrastructure at risk.
- WS-3 Evaluate the impacts of rising sea and groundwater levels on soil storage, infiltration rates and inflow to stormwater and wastewater collection and conveyance systems; consider longer-term influences on water quality; and develop strategies for implementing reclaimed water and stormwater reuse projects that account for current and future conditions.
- WS-4 Develop Integrated Water Management Plans that present a joint assessment and planning strategy involving local water utilities, wastewater service providers, water managers, and partners to the Southeast Florida Regional Climate Change Compact, for coordinated consideration of stormwater use and disposal, traditional and alternative water supplies, wastewater disposal and reuse, and water conservation measures for use by local leadership to guide planning decisions as well as amendments to applicable codes and regulations.
- WS-5 Coordinate with the South Florida Water Management District, Drainage/Water Control Districts, and public works officials to identify flood control and stormwater management infrastructure already operating below the design capacity. Further examine water control structures to ensure that they can provide for inland or upstream migration of riparian species as freshwater habitats become more saline.
- WS-6 Develop and apply appropriate hydrologic and hydraulic models to further evaluate the efficacy of existing water management systems and flood control/drainage infrastructure under variable climate conditions and develop feasible adaptation strategies.
- WS-7 Develop and test adaptation improvements needed to maintain existing levels of service and use cost-benefit analysis to prioritize potential improvements.
- WS-8 Incorporate and prioritize preferred improvement projects in capital improvement plans and pursue funding.

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- WS-9 Monitor changes in rainfall patterns, temperature means and extremes and sea level rise through coordination with NOAA, and other key organizations/partners, to better predict future wet-season and dry-season rainfall as well as the salt content in the wells of agricultural lands. Monitor emerging science in order to assess the adequacy of regional climate models. Choose an annual conference or other venue at which such trends can be reviewed at regular intervals.
- WS-10 Manage water storage in the region's publicly-owned uplands and wetlands and in other land uses compatible with water storage, including wetland restoration, certain agricultural operations and certain renewable energy production facilities. This will further serve to protect high quality drinking water supply, increase aquifer recharge, and as a means for managing saltwater intrusion.
- WS-11 Support and advocate for complete implementation and funding for the Comprehensive Everglades Restoration Plan (CERP) or its updated versions as fundamental to Everglades restoration, to include increased freshwater flows to the Everglades, thereby improving water quality, maximizing regional freshwater storage and aquifer recharge, which will become increasingly important under variable climate conditions and in the face of sea level rise.
- WS-12 Develop land acquisition priorities in a regional setting to protect high quality drinking water supply.



Natural Systems and Agriculture: Climate change threatens natural areas, regional populations of native plants and animals important to southeast Florida's culture and economy and sustainable local industries including ecotourism and farming. South Florida natural communities exist within specific climate, water and salinity regimes. Coral reefs and seagrasses grow in clean, shallow seawater with abundant sunlight and stable temperatures and mangroves thrive in the often brackish areas between the low and high tide lines. Freshwater dependent hardwood hammocks and pine rockland forests support an abundance and diversity of rare plants and animals unrivaled in the United States. Similarly, both Everglades tree islands and agricultural lands depend upon wet and dry seasonal rainfall patterns that have existed for centuries.

Given the opportunity, species and industries can adapt and migrate. This migration, necessary for the preservation of natural plant and animal communities as well as those farmed communities upon which people depend, will require careful and thoughtful planning.

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Land use regulations and land acquisition programs will have to allow for such migrations. Hardened shorelines may become living shorelines. Environmentally or financially distressed properties may become the future home of agricultural production or a refuge for tree species once found only in the Florida Keys.

The following strategies recommend ways in which all levels of government can share information necessary to plan for and implement the maintenance of natural areas, rare and endangered native species populations as well as the green industries necessary for our local economy.

- NS-1 Develop a vital signs status and trends monitoring program for biological communities. Key parameters may include rate of sea-level rise; saltwater intrusion boundary and monitoring wells; landscape-level vegetation patterns; percent coral cover and condition in offshore reef zones; water temperature and pH in areas; and occurrence and range of invasive exotic plants and animal species. Ensure Department of Health beach water quality monitoring continues and expand methods of notifying the public and tourism industry when exceedances are detected.
- NS-2 Promote collaborative federal, state and local government conservation land acquisition programs that include fee simple and less-than-fee approaches which reflect regional acquisition priorities and result in conserving a diversity of natural areas including hot spots of biological diversity, protecting open space and buffer areas to create or maintain resilience and adaptive capacity of existing natural areas to migrate inland/upslope.
- NS-3 Support regional fire management coordination efforts emphasizing frequent, low intensity fire regimes in wetland and pine forest systems to maximize habitat quality, resilience to change and carbon neutrality while preventing fuel load build up that leads to major carbon releases.
- NS-4 Monetize ecological services provided by natural systems and create a sustainable funding mechanism for their protection and management.
- NS-5 Coordinate regional invasive exotic species prevention and control efforts so as to minimize the diversity and abundance of habitat-homogenizing exotic plant and animal species by emphasizing prevention of new invasions and early detection/rapid response to nascent invasions.
- NS-6 Coordinate "living shorelines" objectives at regional scale to foster use of green infrastructure (e.g. coral reefs and mangrove wetlands) instead of or in addition to grey infrastructure (e.g. bulkheads).

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- NS-7 Leverage existing work of the Florida Reef Resilience Program's "Climate Change Action Plan for Florida's Coral Reef System 2010-2015 for protection of marine habitat.
- NS-8 Maintain or restore multiple areas of habitat and large-scale connectivity to facilitate population stability and habitat shifts resulting from climate change.
- NS-9 Minimize diversity and abundance of habitat-homogenizing exotic plant and animal species by monitoring for introductions, colonization, establishment, and connections with other populations.
- NS-10 Engage and cooperate with marine resource agencies to maintain coral reef (e.g., selective breeding) and mangrove ecotones as estuarine habitat and natural barriers to storm surge for maintaining coastal biodiversity.
- NS-11 Advocate for federal and state research funding to:
- identify linkages between marine system (e.g. coral reefs and mangrove wetlands) area/condition and hazard risk reduction
 - identify seagrass, mangrove, and coastal freshwater marsh environmental tolerances to changing factors such as salinity, water depth, substrate, and nutrients.
 - monitor and document root-zone and freshwater marsh peat salinities and changes to vegetative communities in response to saltwater intrusion.
 - improve Florida Bay shallows bathymetry and use SLR and storm surge modeling to aid identification of habitats at risk.
 - develop more accurate climate projections and hydrological and ecological models to aid in adaptive planning and management.
- NS-12 Develop regulatory requirements that compatible dredge material may be utilized in the restoration of previously existing or establishment of new seagrass beds.
- NS-13 Develop long-term turtle-nesting beach preservation strategies and methods to include identification of those narrow beaches lacking natural dunes which might possess high turtle-nesting density but be prone to high nest mortality due to more frequently expected storms and identify more stable 'receiving' beaches to which nests may be relocated.
- NS-14 Identify zoos, aquariums, herbariums and gardens that might be the repository for seed stock and captive breeding programs for those listed plants and animals under imminent threat of local extirpation due to sea-level rise.
- NS-15 Compile species information for rare plant species in threatened natural communities and develop adaptation plans that include, at a minimum, seed bank repository collection and assisted propagation.

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- NS-16 Protect agricultural lands that may be important for community and ecosystem resilience by coordinating land use and zoning policies regionally to minimize the conversion of farmland to non-agricultural uses.
- NS-17 Develop and seek funding for a regional Agriculture Purchase of Development Rights Program and/or Transfer of Development Rights program to maintain open lands for food production, aquifer recharge, habitat, and buffers.
- NS-18 Seek public support for farmland preservation through research on benefits for climate change mitigation and adaptation and regional public education campaigns, with particular focus on students.
- NS-19 Support further research on best practices for agriculture in southeast Florida that contribute to carbon sequestration, reduce greenhouse gas emissions, and protect groundwater. Support agencies such as the University of Florida's Institute of Food & Agricultural Sciences that educate growers/farmers on best management practices. Provide incentives to growers/farmers who choose to utilize such practices.
- NS-20 Collaborate with growers/farmers through outreach programs such as, 'Agricultural Tools for Managing Risks due to Climate Change', to identify agricultural areas suitable for adaptation strategies such as the use of alternative crops, enhanced fresh water storage, soil subsidence management, and carbon sequestration opportunities due to the potential of changing weather conditions and increasing saline conditions in ground water.
- NS-21 Analyze potential blighted sites and develop an approach for converting underutilized or unused properties and structures, including properties in financial distress, into community gardens or farmers' markets. (i.e. Redfields to Greenfields)
- NS-22 Identify and reduce obstacles for permitting agricultural practices (including growing and selling produce) in urban areas, in order to encourage urban farming and reduce GHG emissions related to the transport of farm produce.
- NS-23 Support educational institutions in their initiatives to develop a workforce for a sustainable economy, such as agritourism and sustainable food production.



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NS-24 Create a working group to expand marketing efforts such as Redland Raised to promote local organic and sustainable agriculture and economy by connecting farmers with local users such as restaurants, grocers, and farmers markets and encourage the establishment of farm-to-school initiatives and community supported agriculture programs.

Energy and Fuel: *The vast majority of the energy consumed in the region is to fuel our vehicles and to generate electricity for our buildings. It is widely understood that the most accessible and cost-effective way to reduce energy consumption is through efficiency and conservation. The recommendations in this area address these important strategies and also take the next step by encouraging the use of alternative and renewable energy. They call for public-private partnerships, address barriers, including regulatory processes, which currently prevent the broad application of these technologies. Recommendations are comprehensive, ranging from setting regional goals, increasing renewable energy capacity to establishing a regional framework to deliver finance options, to preparing our region for the shift to plug-in electric vehicles.*

As discussed in the Sustainable Community and Transportation Planning Area, our region is auto-dependent due to its sprawling development pattern. The recommendations presented in this area aim to increase the options and improve services provided on the transportation network. Strategies include those to improve mobility across county lines as well as promote the use of public transportation along key corridors. With limited funding for capital projects and increasing operation and maintenance costs, recommendations focus on strategic service improvements as well as strategies to attract individuals who could drive their cars but who choose to ride transit or share a ride because of the conveniences and other benefits represented by these choices. The importance of the movement of freight to the economic, environmental, and social prosperity of our region cannot be overstated. As such, recommendations aimed at increasing the efficient movement of freight and shifting to lower-carbon modes are included in this area, and complement regional and statewide freight and port planning underway by transportation entities and local governments.

- EF-1 Undertake regional efforts to advance energy-efficiencies, energy conservation and the deployment of renewable and alternative energy technologies in existing and proposed developments through local ordinance, incentives, education, and energy efficiency financing.
- EF-2 Incorporate sustainable building and neighborhood ratings or national model green building codes, including but not limited to those defined in Section 255.253(7), Florida Statutes, into municipal codes region-wide.
- EF-3 Work collaboratively toward the establishment of a regional framework to deliver Energy Efficiency and Renewable Energy finance options, in addition to other local government initiatives and partnerships, to advance regional GHG emissions goals, the use of alternative and renewable energy technologies, and in furtherance of green sector economic development.

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- EF-4 Set a recurring five-year regional goal to increase renewable energy capacity and conservation – which includes the co-benefits of economic development and job creation -- through revising building and zoning codes and architectural design guidelines to allow for, encourage, integration of renewable energy sources.

- EF-5 Seek amendments to existing land development regulations and development standards and revise or eliminate provisions that act as a barrier to the installation and use of renewable energy systems.

- EF-6 Study increasing service frequency on key routes and developing targeted transit routes, in the model of the I-95 Express bus service, and “The Flyer” route from Miami International Airport to Miami Beach, to bring people from residential areas to regional centers of employment. Utilize existing studies of routes to inform this process.

- EF-7 Use and expand Transportation Demand Management (TDM) programs, which reduce peak hour and single-occupant vehicle travel.
 - a. Vanpool and Carpool Programs - Work with MPOs, South Florida Commuter Services and South Florida Vanpool to identify and pursue opportunities to more fully utilize and expand these programs.
 - b. Car and Bike Sharing Programs - Work with companies providing these services and strategic partners (universities, municipalities, large employers, etc.) to establish zip car, bike sharing and personal vehicle sharing programs.
 - c. Commute Reduction Ordinances – Encourage local governments to explore adoption of commute trip reduction ordinances.
 - d. Employee Benefits – Encourage sharing of information on and use of employee benefits that support use of walking, biking and transit modes for work commutes (e.g., pre-tax benefits and Emergency Ride Home program).

- EF-8 Complete, expand and connect networks of bicycle and pedestrian facilities, including support access to transit.
 - a. Prioritize implementation of planned bicycle and pedestrian networks. Evaluate whether these facilities are connected regionally and on a local scale to major employment, education, and recreation centers.
 - b. Implement a roadway design project checklist that includes measures of pedestrian, bicycle, and transit (e.g. bus bay) accommodation.
 - c. Work regionally to improve safety for pedestrians and bicyclists
 - d. Consider regional adoption of Transit, Pedestrian, and Biking programs that aim to improve access to transit.
 - e. Develop policies to increase designated bike parking facilities at office and retail developments.

- EF-9 Increase the amenities and infrastructure available to transit passengers, such as shade, shelters, kiosks, and real time boarding information.

- EF-10 Identify means to effectively engage the multiple public and private sector entities with roles and responsibilities involving the provision and maintenance of transportation infrastructure and the delivery of transportation services in the region. Document current and evolving coordination efforts among these entities.
- EF-11 Support or facilitate development and distribution of local sources of sustainable fuels and availability of fueling infrastructure – policies to create conditions for the development of locally sourced sustainable alternative fuels (bio-diesel/waste-based bio-diesel) and include these policies in regional plans and Local Comprehensive Plans. Incentivize and remove legislative, local code that may act as obstacle to stimulate the alternative energy industry.
- EF-12 Establish a working group of public and private stakeholders to develop a strategy to promote the use of Plug-in Electric Vehicles in the region.
- a. Establish locations where infrastructure is needed. Solar charging options should be prioritized to maximize mitigation benefits and to improve the community's emergency management preparedness in times of power outages.
 - b. Develop policies to incentivize the deployment of infrastructure to complement transit oriented corridors. Reduced transit fares should be a consideration for riders accessing transit facilities by electric vehicles.
 - c. Work with relevant stakeholders to streamline permitting processes associated with charging equipment to encourage the safe and expeditious installation on customer premises and elsewhere.
 - d. Coordinate monetary and non-monetary incentives available to the general public and organizations purchasing electric vehicles.
 - e. Support regional efforts to establish a framework for siting/locating public electric vehicle charging stations.
- EF-13 Develop a toolbox of strategies for maximizing the efficiency of the existing transportation network for use by the operating agencies in the region. Information provided should include steps for implementation, costs, and effectiveness in reducing GHG emissions. Among the strategies to consider are use of roundabouts, real time operation of the traffic signal system, traffic signal prioritization and queue jumps for transit, interstate ramp metering, and employment of a virtual freight network (freight network managed in real time using intelligent transportation systems).
- EF-14 Develop policies to facilitate and streamline the deployment of energy efficient and renewable energy such as the installation of LEDs and use of solar power for public infrastructure such as street lighting, parks, and parking facilities. Survey counties, cities and regional agencies with lighting infrastructure to determine the

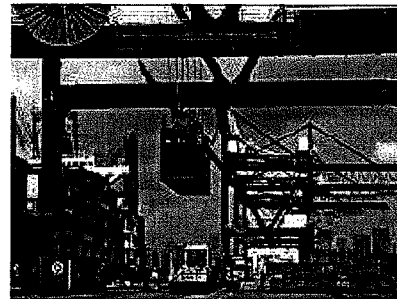
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level of deployment and to gather best practice policies and implementation steps to facilitate the application of efficient lighting practices in additional infrastructure.

EF-15 Adopt or create a green rating system for roads to reduce emissions from construction, maintenance, and agency operations through practices such as using recycled materials, purchasing materials found or manufactured in the region, substituting fly ash for cement, using warm-mix instead of hot-mix asphalt-, and requiring construction contractors to implement emissions reductions practices such as using alternative fueled vehicles and clean diesel practices.

EF-16 Provide seamless transitions to increase the use of low carbon modes for the movement of people and freight in the region.



- a. Improve connections among Tri-Rail and county transit service, municipal trolley and community shuttle bus services which may include re-alignment of routes. District circulators, such as the Metro Mover in downtown Miami which connects to Metro Rail provide the last leg of a commute for transit riders and should have high frequency and ease of transfer.
- b. Implement seamless regional transit fare media across transit services in the region while improving walking and biking access to transit.
- c. Develop planning strategies to address planning for the “First and Last Mile” of transit trips.
- d. Partner to implement a Virtual Freight Network as part of the region’s comprehensive Intelligent Transportation System/ Transportation System Management and Operations Programs. Establish a software application to provide “load matching” for shippers and truckers to alleviate “deadheading” of empty trucks traveling back to destination.
- e. Incorporate climate adaptation strategies and GHG emissions inventories into Seaport and Airport Master Plans and Regional Freight Plans. Plans should address the critical last mile to and from major seaports and airports in part by providing comprehensive plan land use designations, policies, and standards that protect that function of roadway segments connecting seaports and airports (hubs) to corridors, such as interstates.
- f. Establish performance measures including VMT reduction and emissions reductions monitoring for freight projects such as ship to rail projects which remove drayage truck operations. Support clustering of Distribution Center facilities to support more rail/intermodal use and economic development.

EF-17 Develop a strategy for incentivizing the development of truck parking with electrification facilities and the use of auxiliary power units to reduce extended idling by trucks.

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- a. Survey state, local and regional transportation agencies for existing studies identifying trucking patterns and needs.
- b. Identify strategic locations for truck parking facilities and seek competitive funding opportunities as a region.

Risk Reduction and Emergency Management: *South Florida is no stranger to the devastating effects of hurricanes and other severe weather. Our experience has made us experts in planning, preparedness, response and recovery. Our emergency managers are trained in an all risk-based, all hazards approach. Disaster can strike anytime, anywhere. It takes many forms -- a hurricane, a tornado, a flood, a fire or a hazardous spill, an act of nature or an act of terrorism. In fact, in the aftermath of September 11, homeland security preparedness was easily incorporated into Southeast Florida's all hazards approach to emergency management. An emergency can build over days or weeks, or hit suddenly, without warning. Southeast Floridians are accustomed to this and can prepare, recover, and return to normal.*

Climate change however is not immediately visible and is slow moving, with no return to "normal". Sea level rise does not appear on the on 6 o'clock news weather map moving towards the coast of Florida. It is that difference that makes it more difficult for the general public to understand and to react to climate change. However, we are experiencing more extreme weather conditions – from extreme rain to extreme droughts, from unseasonable heat waves to early cold fronts. Climate is changing. Adapting and planning for more and possibly new weather-related threats needs to be incorporated into preparedness procedures, and one step further is to include climate change in our emergency preparedness and hazard mitigation plans. The collection of strategies and actions in this area is aimed at integrating climate change risk into all hazards response model.

- RR-1 Perform vulnerability analysis to identify and quantify the economic value of regional infrastructure at risk under various sea level and other climate change scenarios utilizing inundation mapping, modeling, and other appropriate tools. While the initial regional vulnerability assessment completed by the Compact Counties for use in this Regional Climate Action Plan has yielded important new insights on regional risk, additional and ongoing analysis is required to further refine our current understanding and to monitor changes in Southeast Florida's risk profile over time.
- RR-2 Develop policies, regulations, strategies, and standards that will serve to reduce future risk and economic losses associated with sea level rise and flooding in designated Adaptation Action Areas through infrastructure improvements and by directing development and redevelopment out of Adaptation Action Areas.
- RR-3 Evaluate adaptation responses for communities at risk to include development and implementation of:
- methodologies for the assessment and evaluation of evacuation and relocation options
 - model evacuation policies and procedures for communities at increased risk of flooding
 - model relocation policies for affected communities.

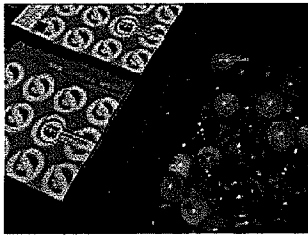
- RR-4 Incorporate climate change adaptation into the relevant Local Mitigation Strategy (LMS) to reduce or eliminate long-term risk to human life and property from disasters. Within the LMS, update local risk assessments to include climate change in the hazard analysis and vulnerability assessment section. Develop strategies for hazard mitigation and post-disaster redevelopment planning.
- RR-5 Identify transportation infrastructure at risk from climate change in the region; determine whether, when, where, and to whom projected impacts from climate change might be significant. Employ inundation mapping, modeling and other appropriate tools to assess the vulnerability of transportation infrastructure to the projected impacts of climate change under various sea level rise and other climate change scenarios. At a minimum, assess the vulnerability of the following transportation infrastructure:
- local transportation networks of the Compact Counties
 - the Regional Transportation Network designated by the Southeast Florida Transportation Council composed of interconnected, strategic corridors (roadway, rail line, waterway), hubs (airports, seaports, freight rail terminals, passenger rail and intercity bus terminals) and connectors critical to the mobility of people and freight and the region's economic competitiveness and quality of life; and evacuation routes adopted under the Statewide Regional Evacuation Corridor Program.
- RR-6 Develop adaptation actions that prioritize the people, places, and infrastructure most vulnerable to the projected impacts on the transportation network. Use a risk-management approach to adapt the existing network including criteria such as timing, likelihood, intensity of anticipated risks as well as costs relative to action versus inaction. Develop regional priorities for short and long term maintenance and retention of the transportation network for a 50 year and a 100 year timeframe; evaluate the costs and benefits for maintenance and retention of existing transportation infrastructure, or construction, maintenance and retention of new infrastructure.
- Address issues of inequality and environmental justice associated with climate change impacts and adaptation. Involve all parts of society in the development design and implementation of adaptation actions addressing the transportation network.
 - Identify those strategies that provide co-benefits, such as improving disaster preparedness, promoting sustainable resource management, and reducing GHG emissions including the development of cost-effective technologies.
- RR-7 Develop policies to incorporate climate change adaptation strategies into hazard mitigation and post-disaster redevelopment planning.

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RR-8 Ensure that land development regulations and plans allow for the ability of plant and animal species to migrate inland as sea levels rise (e.g., limit armoring.) Ensure that land acquisition priorities consider landscape features which may limit species ability to migrate in response to sea level rise and other impacts related to climate change.

RR-9 Enforce Coastal Construction Line and Coastal High Hazard Area designations.



Outreach and Public Policy: *Outreach and Public Policy recommendations are combined in recognition of the fact that the best planning efforts in the world will not be implemented or reach their full potential without the support of the public, often through local government public outreach programs, and without the leadership of local, state and federal policy makers and private sector decision makers who are committed to a sustainable planet.*

Outreach: Communicating the risks related to climate change and the value of adapting policies and practices to become more resilient is extremely challenging. Today's world is marked by instant communication, immediate information and multi-tasking behaviors. News and information related to climate change is difficult to communicate in a sound bite. It's relatively easy to communicate the threat of an imminent storm, tornado or other natural disaster, but much more difficult to mobilize the public to hazards that unfold over years and decades. The state of the current economy also makes a long term discussion on climate change more difficult when many Americans are thinking about short term housing, employment and other immediate needs. And, of course, the science of climate change is still contested by some.

The strategies and actions in this area aim to educate stakeholders in all sectors and at all levels – from the general public and voters to elected officials, professionals and other decision makers. These are initiatives to inform and create a common understanding of the benefits of energy independence, energy use reduction, water conservation, smart growth, and natural area protection that will, create demand for a healthy, sustainable and resilient region.

Public Policy: While a well-informed public is a key factor to influence public policy, without advocacy on behalf of sustainability or any other public good, policies would simply reflect narrow special interests. In recognition of this political reality and in furtherance of Compact policy related commitments, the Compact Counties have adopted joint state and federal legislative programs and advocacy before the Congress and the Florida Legislature. Policy recommendations in the Regional Climate Action Plan further this effort and are intended to be the next step in urging policy makers to support ordinances, regulations and state and federal policies on behalf of the region.

A key public policy recommendation in the plan calls for Congress to provide for a definition of Adaptation Action Areas (AAA) in federal law and the subsequent authorization of AAA to receive appropriations through US Army Corps of Engineers and EPA funding sources. This policy compliments numerous recommendations noted in the Sustainable Communities and Transportation Planning element calling for the designation of AAA in local comprehensive plans.

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Additionally, the continuation and enhancement of advocacy efforts on behalf of Southeast Florida's legislative priorities through regional collaboration are necessary to ensure that state and national policies considered during these uncertain economic times do not impede or negatively impact regional efforts underway. Recommended policies are intended to further implementation of the Regional Climate Action Plan.

- PO-1 Public outreach to residents and elected officials defining Adaptation Action Areas and the benefits of the designation of such areas.
- PO-2 Develop outreach programs to increase public awareness about hazards exacerbated by climate change and mitigation and adaptation strategies by the local governments and other agencies to minimize damage and risk.
- PO-3 Provide education and improve communications on energy efficiency and available technologies with a focus on both short-term and life-cycle economic and energy gains, and incentives available within the region (federal, state, local and commercial).
- PO-4 Leverage resources for campaign and promotional advertisements by coordinating public transportation messaging in the region to attract non-transit-dependent (choice) riders. Messages should focus on making riding transit "cool."
- PO-5 Deploy social media applications, (apps) to facilitate use of transit including access to real-time information such as arrival times.
- PO-6 Integrate consideration of climate change impacts and adaptation into the planning, operations, policies, and programs of local and regional transportation agencies. Develop policy statements to incorporate the consideration of climate adaptation into planning processes and investment decisions and adopt the Guiding Principles for Climate Change Adaptation developed by the Interagency Task Force on Climate Change Adaptation and subsequently adopted by all federal agencies, including the U.S Department of Transportation:
 - Adopt integrated approaches
 - Prioritize the most vulnerable
 - Use best-available science.
 - Build strong partnerships.
 - Apply risk-management methods and tools.
 - Apply ecosystem-based approaches.
 - Maximize mutual benefits.
 - Continuously evaluate performance.
- PO-7 Develop early warning systems and social media applications (apps) to both inform residents and visitors of extreme high-tide events and to raise overall awareness.

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- PO-8 Develop strategies to promote fuel efficient driving habits and raising awareness of rules and safety practices for sharing the road with bicyclists and pedestrians. Conduct best practice research on existing campaigns and look for opportunities to integrate tools into existing high school, county and municipal driver education courses, traffic school curriculum, truck driver training, and fleet associations. Also include messaging on the benefits of purchasing fuel efficiency vehicles.
- PO-9 Federal Surface Transportation Authorization. Advocate for new authorization of the federal surface transportation programs with increased priority for funding public transit and non-motorized travel and integrated regional and local planning as means to reduce the greenhouse gas emissions from the transportation sector. Such a federal program should explicitly incorporate climate change and shift priorities toward programs that encourage reinvestment in existing infrastructure and communities ("fix-it-first" programs), support public transportation and transit-oriented development, and address congestion management through means other than new road building.
- PO-10 Reform Transportation Models and Enhance NEPA Processes. To recognize when shifts are taking place in the true costs of road and transit, the surface transportation authorization legislation should encourage the development of up-to-date models and tools that measure the relative shifts in auto and transit costs, both up-front and on an operating basis as well as costs related to climate impacts and performance. Further, the U.S. Department of Transportation should be directed to develop ways and means to enhance the NEPA process in this regard as NEPA is central to all highways and transit project investment analysis.
- PO-11 Advocate for stronger Corporate Average Fuel Economy (CAFE) Standards and enforce their adoption.
- PO-12 Modify existing public outreach, education and engagement programs at natural areas (including upland, wetland, marine, coastal and nearshore environments) to include climate change mitigation and adaptation messaging and volunteer opportunities to enhance green infrastructure that will facilitate climate change resilience and adaptation.
- PO-13 Initiate a regional public education campaign to educate residents, business owners, policy makers on the merits of preserving open land as an 'insurance policy' for adaptation to sea level rise in South Florida.
- PO-14 Support and advocate for continued implementation and funding for the Comprehensive Everglades Restoration Plan to ensure Everglades' restoration, and the viability of local water resource management related to regional water

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storage and aquifer recharge, important under variable climate conditions and sea level rise.

- PO-15 Identify means to effectively engage the multiple public and private entities with roles involving the provision and maintenance of transportation infrastructure and the delivery of transportation services on addressing climate change. Document current and evolving coordination efforts among these entities.
- PO-16 As called for in Compact, the Compact Counties should continue to advocate that Congress to pass legislation that recognizes the unique vulnerabilities of Southeast Florida to climate change impacts, and allocate federal funding based on vulnerabilities to climate change impacts, with special attention in funding projects to adapt to the impacts of sea level rise.
- PO-17 The Compact Counties should continue to urge Congress to provide for Adaptation Action Areas designation in federal law to authorize funding in Interior and Environment and related agencies appropriations bills.
- PO-18 The Compact Counties should continue to urge Congress to provide recognition of an "Adaptation Action Area" through designation in federal legislation for those regions, such as Southeast Florida, that are uniquely vulnerable to climate impacts, including sea level rise, for the purpose of prioritizing funding for infrastructure needs and adaptation planning. This specifically includes support for the inclusion of Adaptation Action Area authorizations for the Army Corps of Engineers (USACE) and the Environmental Protection Agency (EPA), enabling at-risk regions to develop long-term plans for adaptation.
- PO-19 The Compact Counties should continue to urge Congress to pass federal legislation that would create a funding source to finance infrastructure projects needed by state and local governments to adapt to the impacts of climate change and the growing regional needs for improved infrastructure with emphasis on investments in areas such as water management, water supply, transportation and other projects that provide hazard mitigation and serve to reduce risks to urban infrastructure from extreme weather event and rising sea levels.
- PO-20 The Compact Counties should continue to urge Congress to pass legislation that removes federal barriers to Property Assessed Clean Energy (PACE) residential initiatives that are intended to assist property owners to finance energy efficiency and renewable energy improvements.
- PO-21 The Compact Counties should continue to seek the support of other municipal and county jurisdictions including the Leagues of Cities within Florida for the purpose of building coalitions, sharing resources, and influencing state and national policy on mutual climate related issues.

PO-22 The Compact Counties should continue to advocate for a national Coalition with states, regions and counties that are subject to the impacts of climate change with special emphasis on coastal entities experiencing sea level rise for the purpose of sharing resources and advocating for federal policy and funding for adaptation planning and infrastructure.

VII. Conclusions

This draft Regional Climate Action Plan provides the initial framework for an ongoing regional commitment to building resilience and sustainability as cornerstones of Southeast Florida's regional economic, social and ecological system. The five-year scope of this draft document is indicative of the fact that this is the beginning rather than the end of the Regional Compact process. The Compact Counties recognize that a given document is less important than the ongoing collaborative process of assessing progress over time, developing new policies and collaborations with the private and nonprofit sectors to adjust accordingly and incorporating new knowledge provided by ongoing scientific endeavors. While much can be learned about sustainability and resilience from past experience, new technologies, changes in the regional economy and changes in the historical climatic conditions within Southeast Florida require active learning over the decades to come. The Southeast Florida Regional Climate Compact has developed the institutional capacity to enable the collaborative learning required to meet these challenges over time.

Next Steps

The release of this draft Regional Climate Action Plan is the first of several subsequent steps to follow in the Regional Compact process. The following provides an overview of these subsequent next steps:

- Upon release, the draft Regional Climate Action Plan will undergo a 60-day public review and engagement process in which we hope to obtain additional ideas, comments and specific commitments from cities, regional entities and the private sector to assist with implementation.
- Upon conclusion of the 60-day review period, the Compact staff will complete an Implementation Matrix to identify lead and supporting entities for implementing specific recommendations contained within this document. A final Regional Climate Action Plan will be developed incorporating the public comment received during the review period.
- Upon completion of the final Regional Climate Action Plan, the Compact Staff Steering Committee will transmit the final plan to the four Boards of County Commissioners for the acceptance and/or approval of the final recommendations.
- Concurrent with the finalization of the Regional Climate Action Plan, the Compact Staff Steering Committee and members of the three sector working groups will continue development of a set of progress indicators for use in monitoring and evaluating the impact of implemented recommendations in building resilience and sustainability in Southeast Florida.

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- The Compact Counties will continue to collaborate with the Southeast Florida Regional Sustainable Communities Partnership funded by the US Department of Housing & Urban Affairs in addressing a wide range of sustainability and livability considerations for Southeast Florida.
- Annually, the Compact Policy Coordination Team will continue the Compact energy and policy coordination process for state and federal legislation and will continue to monitor legislative developments in both levels of government.
- In early 2013, the Sea Level Rise Projections Technical Advisory Committee will reconvene following the December 31, 2012 publication deadline for peer-reviewed scientific literature to be used in the Fifth Assessment Report of the Intergovernmental Panel on Climate Change due in 2014. Members of the technical advisory committee have advised that they anticipate many new publications in 2012 that will have significant bearing on mid to longer-term rates of sea level rise as an issue of concern for Southeast Florida. At that time, the technical committee will provide regionally consistent sea level rise projections for use in the Compact process through 2100 while adjusting guidance provided for 2030 and 2060 as warranted by the science.

The Significance of the Southeast Florida Regional Climate Change Compact

While providing direct benefits to the region, the Compact has provided a national model for state and federal agency engagement with local government around the specific issues of place. As the Compact is led by local government and further, as the Compact represents a significant aggregation of effort by four counties containing over 100 municipalities, it has become a highly efficient mechanism for state and federal agency engagement in the local process. Since its adoption in early 2010, the Compact has received extensive technical support from NOAA, the United States Geological Survey, the Army Corps of Engineers, EPA Region IV as well as the Florida Department of Transportation, the Florida Department of Economic Opportunity and the South Florida Water Management District.

The regional scale of the Compact has enabled participants to develop resilience strategies that effectively integrate human and natural systems. The Regional Action Plan has effectively connected resilience efforts within the urban core of Southeast Florida with broader ecosystem scale efforts including comprehensive Everglades restoration, protection of the Southeast Florida coral reef track, and regionally important threatened and endangered species and habitats. The ecosystem services provided to the human settlements of the region are evident in the nature of projected vulnerabilities such as salt water intrusion into local drinking water supplies and the increased exposure to storm surge impacts associated with the loss of natural barriers. And the strategies developed to enhance environmental and habitat quality fully recognize the benefits these strategies will have for the ongoing livability of the region.

The Compact has enjoyed stable, bi-partisan political support since its initiation in 2009 despite the swings in the political salience of global climate change observed over this time in state and federal political dynamics. This stability has remained despite the departure of early champions of the Regional Compact from County Commission seats and a change of

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administration within one of the four Compact Counties. The scope and extent of regional engagement made possible by the Regional Compact has served to foster on-going bi-partisan support as the Compact continues to enjoy strong political leadership from each of the Compact Counties.

The Compact has become an effective means of changing local, state and federal policy. During the 2011 state legislative session, the Compact Counties successfully lobbied for a provision in Florida's growth management laws that would enable local government to designate areas as "Adaptation Action Areas" as a means to prioritize investments for building resilience and guide future development in a more thoughtful way to reduce risks in vulnerable areas. Following changes to state law, members of Congress have made requests for Adaptation Action Area language in federal law to provide a vehicle for appropriations for adaptation infrastructure. The annual policy coordination process has been twice completed since initiation and is providing a model for county cooperation on other policy issues of regional importance.

As an ongoing collaboration, the Compact provides a formal framework for policy development, implementation and evaluation that is so critical to enable learning over time. This first Regional Climate Action Plan recommends several first steps toward reducing emissions and building resilience to climatic impacts across Southeast Florida, but it isn't the final outcome of the Compact. Compact participants have the opportunity to learn from early implementation: what works and what doesn't, what are the implications of new science, and what are the implications of changes in state and federal policy. Over the next few months, the Compact Counties will continue working with the Coastal Services Center at NOAA to develop a set of performance indicators for use in monitoring and evaluating progress made in implementing this first Regional Climate Action Plan. By implementing an ongoing set of performance metrics for this Regional Plan and by remaining engaged with leading practitioners of science and public policy, the Compact will be well positioned to capitalize on success, learn from challenges, and produce subsequent future iterations of this Regional Climate Action Plan as a means to securing a more prosperous and secure Southeast Florida.

VIII. APPENDICES

- A.** Southeast Florida Regional Climate Change Compact
- B.** Compact Counties' Policy and Advocacy Implementation Report
- C.** A Baseline of Greenhouse Gas Emissions for Southeast Florida
- D.** Unified Sea Level Rise White Paper
- E.** Inundation Mapping and Vulnerability Assessment of Areas at Risk by Sea Level Rise
- F.** Adaptation Action Areas White Paper
- G.** Southeast Florida Regional Climate Change Action Plan Implementation Resolution
- H.** Work Group Recommendations
- I.** Contributing Technical and Staff Experts