

## I. Context

Climate Change has multiple impacts that are interlinked throughout nature's complex system of checks and balances. They include: higher temperatures, Changes in Precipitation Patterns, Species Migration and others.

**Sea-Level Rise is one of the BIG ONES. Why?, because of coastal habitation and investment, because the near shore is the first link of the food chain, and because sea-level could severely impact water supply!**

### A. Sea Level Rise 101 -

Sea levels have been gradually rising for thousands of years. Increasing volumes of water result from polar cap ice melt, but more importantly "thermal expansion" - As water gets warmer, it takes up more space - whether its in a glass, a swimming pool or the ocean. Then there is also the issue of "subsidence", which is occurring in the Mid-Atlantic and hastens the impact of sea-level rise.

**B. Exposures & Vulnerability -- Combine sea level rise with the increasing development of coastline areas and we have increased exposure and vulnerability.**

**Some Inundation Impacts include:**

Damage private and commercial buildings

Flooding of roadways and bridges

Decrease ability to farm or grow things on the land

Interference with coastal industrial operation

Impact to recreational activities

Conversion of upland habitats to wetter habitats

**Saltwater intrusion** will impact fresh water aquifers- which will impact drinking water, irrigation and industrial cooling intake functions

## II. What to DO

**A. Southeast Florida Regional Climate Compact** - started in 2009 by representative on four county commissions - work was formalized- Jan 2010.

**B. Regional Climate Action Plan - RCAP** - is a product of the climate compact - it is intended to create consistent goals, methods and approaches, using common information. **RCAP is a FRAMEWORK for action** - there is no mandate, it is a living document that can be updated as information evolves. It focuses on 1) reducing GHG Emissions and, 2) Adaptation.

### **III. WHAT ARE THE UNIFIED NUMBERS for SoFlo?**

**Green House Gas** ---GHG estimates are 64,917,000 Metric Tons Co2 – coming down from the high 70 Million in 2006. The biggest sector is Transportation with 30 Million, followed by Residential and Commercial, which are 19, and 17 million respectively.

**Sea-Level Rise- Unified Number** – US ACE estimates using 2009 Guidance Document with Key West as landmark point: 3-7 inches by 2030, 9-24 inches 2060.

#### **Impacts**

- One foot rise will primarily impact conservation lands – 80% of it open spaces, although it will have impact on natural systems such as mangroves, scrub mangroves, saline and freshwater wetlands. - Taxable value at risk is \$4 billion.
- At 1-foot the impact on property is the marginal lands and existing drainage infrastructure- with the exception of Monroe- where four hospitals, 65% of schools and 71% of emergency shelters are located within the inundation zone.
- More than 81 miles of road in Miami-Dade, Broward and Palm Beach are impacted.
- At three feet of Sea Level Rise – we have an impact of \$31 Billion. Including 893 miles of road. This has secondary impacts of inaccessibility of other properties, and property depreciation.

### **TO SEE WHAT THIS MEANS FOR THE MARINA DISTRICT**

**[Click here to view Maps](#)**

### **IV. THE END OF SUBSIZED INSURANCE BY NFIP**

The Sea Level Rise situation is complicated and made more urgent by changes to the National Flood Insurance Program. The BIGGERT WATER FLOOD REVISION ACT (passed in July 2012) and now taking effect removes federal subsidies from NFIP and forces gradual adjustment to risk-based rates.

## V. WHY SUPPORT RCAP?

### A. What does RCAP Propose to Do?

1. Focus on reducing GHG Emission and Adaptation
2. Objectives were developed by working groups in 7 key areas:
  - 1) Sustainable Communities and Transportation
  - 2) Water Supply
  - 3) Infrastructure
  - 4) Natural Systems and Agriculture
  - 5) Energy and Fuel
  - 6) Risk Reduction and Emergency Management
  - 7) Outreach and Public Policy

### B. RCAP focused on certain Concrete Objectives

#### 1) Some are focused on GHG Mitigation, like...

- Renewal energy portfolio standard of 20 percent
- Oppose federal drilling off-shore
- Removing obstacles to PACE

#### 2) Others are Adaptation – I'd like to focus on these today

- **Federal legislation to create and fund new infrastructure programs to help local governments adapt to sea level rise**
- **Adaptation Action Areas** - One of the BIGGEST tools that has come out of this is the creation of **AAA (adaptation action areas)** – a new designation available to localities for use in their comprehensive plans. These are areas that are experiences coastal flooding due to extreme high tides, storm surges and related impacts of sea level rise. These are areas that can be designated for maximizing funding opportunities for infrastructure. RCAP promotes:
  - Definition of Adaptation Action Areas in state law
  - Recognition of ADAPATION as a critical strategy
  - Federal recognition of AAA for funding infrastructure vulnerable to sea rise

These objectives are largely framed in the Sustainable communities, Water Supply and Infrastructure section of the RCAP

## **VI. SUSTAINABLE COMMUNITIES GOALS from RCAP**

### **A. Develop policies and strategies and standards to serve as guidance for climate planning – put in Comp Plans, Sustainability Plans, Vision Plans, Storm Water Master Plans.**

- a. Develop sea level rise inundation maps to be included in COMP plan
- b. Develop new flood maps and storm surge maps that take into consideration SLR
- c. Develop salt water intrusion baseline to identify at risk infrastructure
- d. Identify storm drain system at risk of inundation from SLR
- e. Identify blighted sites for conversion into gardens or market, essentially not developed spaces.

### **B. Revise building codes and land development regs to discourage new development and post disaster redevelopment in vulnerable areas.**

- **Elevating on pilings etc** – NFIP STANDARD
- Adjust regulations that prevent owners from acting
- Fast-track building permits and inspections
- Consider how parking regulation/garages impede

### **C. Incorporate AAA areas into comp plan and figure out how to define them.**

- a. Conduct new or utilize vulnerability analysis as a means for identify AAA areas.
- b. Develop development policies for the adaptation areas.
- c. Find specific infrastructure or locations within AAA area for improvement or modification

## **VII. APPLYING A HAZARD MITIGATION FRAMEWORK TO SEA LEVEL RISE: INSURANCE Versus ARMORING versus RETREAT**

A. **Insurance** - In thinking about hurricanes and flood risk, insurance has always been the first approach. It works, but it is expensive and at some point it is not possible to mitigate all the risk. Changes to the National Flood Insurance Program are now needed to manage the vast amount of exposure and make the system solvent. Insurance will work best if the incident rate is not too frequent – but sea-level rise will eventually impact a lot of people all the time.

B. **Armoring (Hardening) -Infrastructure improvement** - retrofitting sewers and pumps, raising road and bridge, building seawalls or dune/beaches, dikes...

How much should be spent? What is the new standard to consider? We need to develop and test water management and drainage systems needed in the future and use a cost-benefit analysis to determine where it makes sense. The problem is that it is too expansive and expensive -you can't armor or harden everything. What will be the criteria? Will it be equitable?

C. **Retreat-** Moving development away from vulnerable areas, this might mean buying up land when possible for return to natural open space.

- Development and implementation of METHODOLOGIES for the assessment and evaluation of evaluation and relocation options.
- Promote federal, state and local conservation land acquisition programs - Understanding the value of open space to solving the problem and allowing migration of natural flora and fauna

D. **What should we do LOCALLY?**

- Incorporate climate adaptation into the LMS to reduce risk and develop strategies for mitigation and post-disaster redevelopment planning
- Buying land as receiving areas for future development and creating TDR

## **VIII. HOW DO WE PAY FOR THESE CHANGES – Public Responsibility VERSUS Private Responsibility**

**A. Public - Some will come from Federal Sources-** Traditionally/Today we look toward FEMA Money – Stafford Act -(Title 44 Code of Federal Regulations [C.F.R.], Chapter 1, Part 201.3). Increasingly – we are going to look toward local investment and private investment.

We have to anticipate how to fund these activities. We have the tax base now – what about in the future? Do we expect the Federal Government to help or the state? How do we move that political agenda? It is critical that citizens express their concern and contact officials – Citizens must advocate for their cause.

### **B. How to encourage responsible actions of private owners**

- Land use controls- gradually rezoning uses
- Requirement for Disclosure when property is for sale
- **Tax incentive – through accelerated depreciation, for donation of development rights, for private mitigation measures.**

These are new ideas, that need to be analyzed and tested. We need academic research on these new policy initiatives.

- **Special Taxing districts to cover costs of servicing high-risk areas and mitigation.**

## **IX. Conclusion**

**A. Public Outreach** --Provide education and outreach to citizens, stakeholders, government officials, business leaders – students etc. on impacts of climate change, energy conservation and promotion, sustainable communities etc.

- Encourage education that will indirectly help voters approve the purchase of open space.
- Develop early warning systems for extreme high tide events

### **B. Support Progressive Policy**

- 1) Support CERP comprehensive everglades restoration plan
- 2) Support Water Management Districts missions
- 3) Urge Congress to provide recognition of an “Adaptation Action Area”
- 4) Urge for appropriation for infrastructure improvements