Editor's Note: *In the original October 2018 issue, we inadvertently published an early draft of the article below. This revised issue contains a significantly revised and updated article. Our apologies for the oversight.*

Priorities for Resilience in Florida

By: Julie Dick

Florida communities have had to confront the realities of increased flooding, living with more water in general, and more intense hurricanes. Restoring the Everglades, and improving water quality are defenses against the impacts of climate change that Florida can no longer wait to implement. Solutions to address high levels of nutrient pollution and implement badly needed projects for Everglades restoration have existed for years. Politically driven legal maneuvers and political delays have gotten in the way of addressing these issues with the urgency they require. The State of Florida has required minimal sea level rise planning for coastal communities. Some of the highest risk sites in Florida, including multiple low lying hazardous waste sites, are not prepared for increasing sea level rise and other climate impacts. Priorities for climate action are readily identifiable through consideration of the comparative environmental and public health threats facing Florida communities. Two basic principles must guide our efforts:

- Climate change will negatively impact quality of life, public health, and our economy, which is directly connected to environmental health. Adaptation and resilience measures need to protect water quality, the environment, and public health.
- Climate planning is relevant almost universally across local government planning and operations. Climate planning will be most effective if it is taken into consideration across the board and conflicts among governing laws and programs are identified and removed.

Additional legal risks connected to infrastructure level of service, coordination among stakeholders, and the Takings Clause of the 5th Amendment of the U.S. Constitution and the Bert Harris, Jr. Private Property Rights Protection Act present an entire additional focus area and are critical considerations in climate, adaptation, and resiliency planning. These topics are beyond the scope of this article but have recently been addressed in the ELULS Reporter and by at least one Florida municipality and will certainly continue to be an important piece of resiliency planning.[1] In the long run, South Florida's ability to withstand the impacts of climate change depends upon its own actions and significant global reductions in climate pollution. Policy and legal leadership from communities and businesses can lead to significant deployment of renewable energy sources and climate pollution reductions. Florida communities, businesses, and elected officials are becoming some of the leaders in climate mitigation, as South Florida Republican Representatives Carlos Curbelo, Ileana Ros-Lehtinen, and Francis Rooney have some of the best Republican voting records on climate in the U.S. Congress.[2]

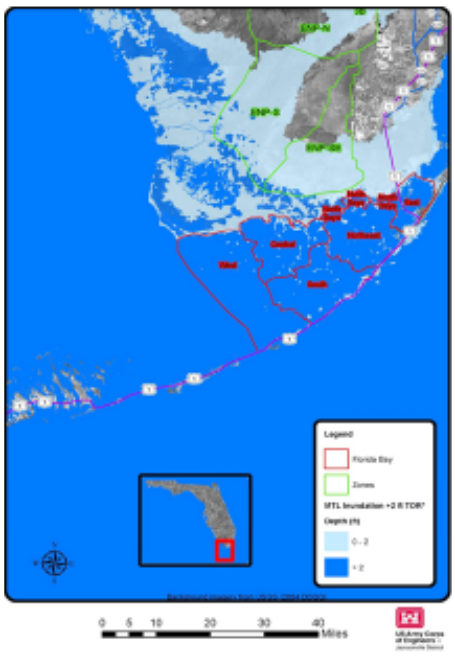
Local governments and businesses play an important role in moving Florida to become a model in addressing climate pollution. Multiple cities and some companies in Florida have taken the "We Are Still In Pledge" to comply with the goals of the Paris Accord or committed to 100% renewable energy. Far fewer cities have negotiated contracts and utility agreements that put them on track to achieve those goals. However, some leaders in the state, like the City of Orlando, are showing significant progress. Incorporation of climate mitigation into broader climate planning occurring in Florida is a topic that deserves additional attention. Climate pollution mitigation, insurance risk, bond ratings, and financing of mitigation and resilience activities are other critical aspects of climate planning that are beyond the scope of this article.

The measures that will conserve and protect water quality, quality of life, and the economy in Florida will help extend the viability and staying power of communities in Florida.

Resilience depends on environmental health. Resilience in Florida depends on good water quality, Everglades restoration, and appropriate management of contaminated properties. Climate change has and will continue to exacerbate existing ecological stresses. Adaptation and resilience measures need to protect water quality, public health, and the environment in order to sustain Florida's ecological health. The algal blooms plaguing the Everglades ecosystem "thrive in warm, calm water.[]… As the climate warms, toxic algae blooms are proliferating worldwide."[3] As climate change contributes to algal blooms and poor water quality, measures to restore and protect the Everglades and water quality become more critical.

The restoration fixes that would address the algal blooms by moving water South from Lake Okeechobee into the Southern Everglades, and eliminating the need for discharges to the Caloosahatchee and St. Lucie rivers, would also greatly improve Florida's resilience to sea level rise. The LiDar maps shown below, from the US Army Corps of Engineers (ACE), projects what South Florida will look like with 2 feet of sea level rise with and without Everglades restoration. Restoring the Everglades clearly physically protects Florida through preventing land loss in the face of sea level rise.

2 Foot SLR Marsh Losses Without Flow Restoration



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RESILIENCE IN FLORIDA

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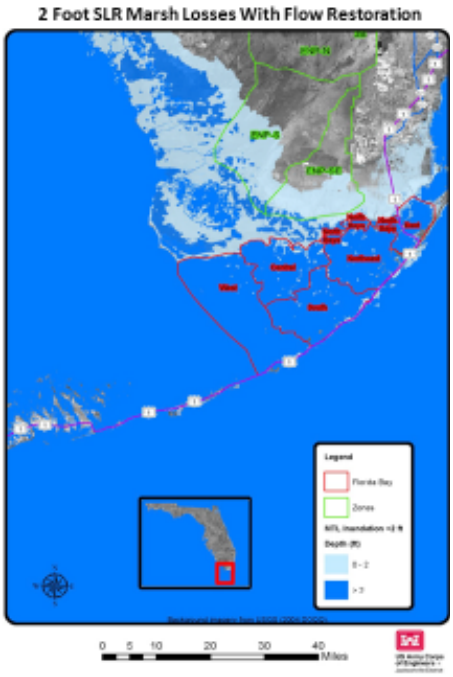

Everglades restoration is key to resiliency. Florida is currently experiencing multiple ecological crises, including fish, turtle, and manatee die-offs, red tide in Southwest Florida, and algal blooms on both coasts.[4] University of Miami Professor Larry Brand blames southwest Florida's red tide "primarily [on] the large amount of nutrient-rich water coming down the Caloosahatchee River into the coastal waters."[5] In 2010 the Scott Administration's Department of Environmental Protection (FDEP), under Secretary Herschel Vinyard, petitioned the US EPA to withdraw its 2009 determination that numeric nutrient criteria are necessary in Florida.[6] Ultimately, after litigation between EPA, FDEP, Earthjustice and Florida Wildlife Federation, FDEP issued it's own Numeric Nutrient Criteria. The regulation of nutrients in Florida has clearly failed to sufficiently address the sources of pollutants impacting the algal blooms. Nutrient pollution will continue to be a litigation issue to watch in Florida.

Political failures to act to protect water quality in the Everglades extend beyond regulation of nutrients, and include unnecessary delays in restoring the Everglades ecosystem. Preventing the discharges of nutrient laden Lake Okeechobee water into the Caloosahatchee and St. Lucie rivers requires freshwater storage South of Lake Okeechobee. The state failed to exercise its option to buy land South of Lake Okeechobee for a reservoir in 2015. While there has been some progress in efforts to secure land needed for a reservoir south of Lake Okeechobee[7], the delays have left coastal communities facing yet another year of estuaries in an economic and ecological crisis. "Over the last decade, as the state fought federal efforts to protect water, shrunk its own environmental and water-management agencies, and cut funding to an algae task force, monitoring for water quality has plummeted."[8] The South Florida Water Management District is the lead agency in the State's role in Everglades restoration projects, yet Governor Scott "ordered budget cuts to water-management agencies for five consecutive years."[9]

Fishing Guide Mike Conner from Stuart reports losing 50% of his business this year as a result of the algal blooms.[10] He describes tourism that trickles up from tourists going out on the water and in turn spending money on hotels and restaurants. Captain Conner says, "[i]f they're [not on his] boat fishing, they're not [t]here."[11] The economic viability of the Florida communities depends on water quality. Recreational fishing in the Everglades has an economic impact of $991 million annually.[12] In the Florida Keys alone, flats fishing generates $34,447,000 in federal tax revenue, and $28,298,000 in state and local tax revenue. The total economic impact from Keys Flats fishing expenditures (including multipliers) is $465,834,000 a year.[13] Ocean recreation and tourism account for 58% of the local economy in the Keys, 2.3 billion in annual sales and support 33,000 jobs.[14] Between 2007 and 2008, over 400,000 visitors and residents engaged in over 2 million person-days of recreational sports fishing in the Florida Keys.[15] Climate, water quality, the environment, and the economy are closely tied together in Florida. Measures that protect water quality enhance resilience and protect the economy.

Contaminated properties

Houston's experience with Hurricane Harvey demonstrates the enhanced environmental and public health threat contaminated properties pose due to sea level rise and exacerbated storm risks posed by climate change. The San Jacinto River Waste Pits Superfund Site lost its protective cap during the storm, and the underlying material was exposed.[16] After the damage from the storm, dioxin levels at the site were "more than 2,000 times higher than the maximum levels the [EPA] recommends for the site."[17] The experience at the San Jacinto River Waste Pits demonstrates the risks contaminated properties face when stronger storms and increased flooding from climate change impact these sites.

The World Resource Institute estimates that Miami Dade County has 8 hazardous waste sites located less than 1 foot above current sea level, 23 sites less than 2 feet above current sea level, and 73 hazardous waste sites less than 3 feet above current sea level.[18] The remediation programs for many of these sites were established years ago, and the impacts of sea level rise and increased flooding from storm surge were not contemplated in the development of the cleanup plans.

The most contaminated properties, which are "priorities for long-term remedial evaluation and response" are identified by the Federal EPA on the National Priorities List (NPL).[19] Sites that "place sufficiently high pursuant to the Hazardous Ranking System"; are designated by the state as "its highest priority"; or where a release otherwise satisfies criteria establishing a public health threat, qualify for placement on the NPL.[20]

In Miami-Dade County alone there are 9 NPL and former NPL sites managed by the U.S. EPA.[21] Three of those sites have been deleted from the NPL, but continue to be monitored by the EPA, and 6 sites remain on the NPL. These 9 sites in Miami-Dade, along with dozens of other sites across Florida are managed by an agency that under the current administration has attempted to remove references to climate from its public documents and websites. The EPA has maintained the site "Superfund Climate Change Adaptation: Information Sources" with links to information and resources to assist in quantifying vulnerability of these sites to climate related impacts.[22] However, the selection of remedies to clean up

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these highly contaminated properties occurs through rulemaking connected to each site's Remedial Investigation and Feasibility Study. In many cases, if not across the board, the cleanup remedies do not appropriately incorporate the impacts of sea level rise and increased flooding from storm surge.

The objective of the Feasibility Study (FS) is to ensure that appropriate remedial alternatives are developed and evaluated.[23] Clean up alternatives for NPL sites are evaluated under nine criteria.[24] Several aspects of those criteria should be revisited for climate change-impacted sites. Overall protection of human health and the environment depends on remedies that can withstand impacts of sea level rise and hurricanes. Long-term effectiveness and permanence of remedies will depend on how remedies are designed to withstand projected increases in sea level rise and other climate risks. For each of these sites, the toxicity and mobility of substances may be impacted by higher water tables and increased risk of storm surge. The concepts of Applicable or Relevant and Appropriate Requirements (ARARs) need to be adjusted so that climate impacts and resilience are incorporated. Community acceptance of remedies should be tied to climate considerations. As NPL sites continue to be impacted by climate change, reconsideration of selected remedies based on the impacts of climate change will likely be necessary at many of these sites across Florida, in order to ensure ongoing protection of human health and the environment.

Climate change planning should be comprehensive

The lack of action to prepare contaminated properties for climate impacts demonstrates the need for more comprehensive climate planning. An adaptation, resilience, climate or sustainability plan is effective to the extent that its goals are reflected in decisions regarding land use and zoning, major infrastructure projects, governing plans, ordinances, code, and in management and preparedness of the highest risk sites. Minimal state requirements for climate planning means that local governments are left to take it upon themselves to effectively prepare for climate change.

Florida Statute § 163.3178 requires the Coastal Element of a local government's Comprehensive Plan to "[i]nclude development and redevelopment principles, strategies, and engineering solutions that reduce the flood risk in coastal areas which results from high-tide events, storm surge, flash floods, stormwater runoff, and the related impacts of sea-level rise." The sea level rise component only applies to the redevelopment component of the Plan, and it is to "be used to eliminate inappropriate and unsafe development in the coastal areas when opportunities arise." Additional hurricane evacuation timing and level of service requirements are also included in the statute. As the specific sea level rise planning requirement only applies to the Coastal Element and only as it relates to eliminating "inappropriate and unsafe development in the coastal areas when opportunities arise," the statute may prove limited in its application and force.

Fla. Sta. § 163.3177(3)(g)10 gives local government the additional option of developing voluntary "adaptation action area designation[(s)]". This designation provides local government with a mechanism for prioritizing adaptation and funding infrastructure needs in vulnerable locations.[25]

Florida's DEP acknowledges the risk of failing to remove conflicts between plans in its Adaptation Planning Guide. "Communities should ensure that the goals of their adaptation plan fit well within the goals set by other planning mechanisms such as their Local Mitigation Strategy, Post-Disaster Redevelopment Plan, Comprehensive Plan, Historic Preservation Plan, and others if applicable. If the goals from different plans conflict, then the implementation phase will likely be difficult and may reach an impasse."[26]

While Miami-Dade County has a Chief Resiliency Officer and is engaged in significant efforts to make the County more resilient, the goals of resilience do not always have sufficient influence on County decision-making. Climate-related planning and preparation needs to be at the forefront of consideration for development projects under consideration. For example, the proposed extension of SR 836 into the Everglades is antithetical to the concepts of preparing for SLR on the basis that the project would extend additional infrastructure into a low lying, vulnerable, and undeveloped part of the County. It would encroach upon wetlands in the Everglades ecosystem, the restoration of which is imperative for the region to withstand the impacts of SLR. The project analysis also fails to include consideration of transit-oriented alternatives that would be more sustainable. While final approval of the project is not complete, the County Commission recently approved an amendment to the Comprehensive Development Master Plan Land Use Element to pave the way for the project.[27] While the South Florida Regional Planning Council found the project is generally inconsistent with the Regional Policy Plan, MDX and Miami-Dade County failed to sufficiently evaluate the project through the lens of resiliency.

The Florida Keys, which is designated an Area of Critical State Concern by the State of Florida, is subject to additional state oversight in its growth and planning, which has forced the County government to adopt and enforce relatively strong development and pollution policies, increasing their climate resilience.

Monroe County has made concerted efforts to resolve conflicts in its land use schemes, infrastructure investment, and planning, which has better prepared it for climate impacts. The additional requirements imposed upon Monroe County as a designated Area of Critical State Concern have been effective in leading to the County policies, rules and planning that have made it more resilient. The Area of Critical State Concern designation for the Florida Keys establishes the legislative intent to establish land use systems to protect the environment, balance growth, address affordable housing needs, protect water quality and property rights, and reduce risks by requiring that permanent residents be able to evacuate in 24 hours in the face of a hurricane.

The Area of Critical State Concern designation, while not originally intended to address climate planning, provides a framework for effectively

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addressing many of the ecological, development and growth constraints climate change places on communities. The development constraints Monroe County has adopted, like prohibiting transfer of development rights to offshore islands, the Tier system to assist with allocating and awarding permits for development, transition to central sewage, a Rate of Growth Ordinance, which limits development, limitations on clearing habitat, and incentives for cisterns and rain water capture all better prepare Monroe County for climate change. The water quality, land use, and hurricane evacuation considerations the Keys are required to incorporate into their planning, have broader application for resiliency in communities that are not designated Areas of Critical State Concern.

These measures are not all part of the Coastal Element of the Comprehensive Plan and would not necessarily evolve out of the statutory requirements Florida has imposed on coastal communities for sea level rise planning. The implementation of these measures came as a result of extensive analysis and problem solving on the part of staff, elected officials, and stakeholders. This planning and work to ensure that land use, infrastructure projects and planning decisions are consistent with the goals of the Area of Critical State Concern status was a result of state oversight forcing the process.

Even with that oversight, the issue of affordable housing has not been completely resolved in a manner consistent with 24-hour hurricane evacuation. A lack of work force housing continues to plague the Keys and challenge the limits of evacuation concerns.[28] However, the Keys have been successful in achieving many of the goals connected to its Area of Critical State Concern designation. Approximately 675 homes were completely destroyed by Hurricane Irma in Monroe County and unfortunately some lives were lost. However, the Hurricane Irma evacuation worked and saved lives.[29] The planning and oversight that went into ensuring growth and development in the Keys does not impede safe hurricane evacuation was extensive, comprehensive, and took time.

Local governments are forced to take it upon themselves in a form of self-help to set and implement effective goals towards planning for sea level rise, flooding, and storms exacerbated by climate change. Regionally, shared resources through the South Florida Regional Planning Council, the South Florida Regional Climate Change Compact, 100 Resilient Cities, and model ordinances and policies from Florida Sea Grant and University of Florida provide a framework to assist cities in the climate planning process. It takes investments in staff, attorneys, consultants, and ultimately in capital and natural infrastructure for municipalities to implement resilience. It is up to local governments to identify the critical climate risks for their community, and put the mechanisms in place to assure that decisions are made through the lens of resiliency.

Conclusion

Current legislative mechanisms for sea level rise planning in Florida do not require the breadth of climate

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planning necessary to create resilient communities. Local governments must take it upon themselves to ensure that climate change is adequately considered in investments, activities, and decisions. Climate impacts will exacerbate quality of life, public health and economic threats connected to environmental stress. Adaptation and resilience measures need to protect water quality, the environment and public health to be viable in Florida.

About the Author: Julie Dick focuses her practice on climate, environmental and sustainability law, regulations and policy. She has worked on various climate, Clean Water Act, Everglades restoration and contaminated property matters in Illinois and Florida. Opinions expressed herein are hers alone and do not reflect that of her current or former clients.

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