Trouble in Paradise

Six Key Issues to Tackle Florida’s Environmental Challenges
Dedicated to Nathaniel Pryor Reed
1933 – 2018

Trouble in Paradise is dedicated to the memory of Nathaniel Pryor Reed, a visionary conservationist who consistently reached across party lines and advocated tirelessly to protect Florida’s quality of life and economy for the benefit of us all. Co-founder of 1000 Friends of Florida, Nathaniel spearheaded this paper and asked 1000 Friends to work with conservation partners to help draft, edit and produce it. He was working on Trouble in Paradise until his final days, sadly passing away before it was completed. Nathaniel Reed was a true statesman whose legacy will be felt for generations to come.

Our Photographers

John Moran is co-director of the Springs Eternal Project, which seeks to inspire Floridians to value, conserve and restore our precious waters. John would like to be a nature photographer who shoots only pretty pictures of Florida but reality keeps getting in the way. Learn more at www.johnmoranphoto.com.

A native Floridian, Carlton Ward is an award-winning conservation photographer who founded the Florida Wildlife Corridor campaign in 2010. His work has been published by Audubon, Smithsonian, National Geographic and others. For more information visit his website at www.carltonward.com.

John Spohrer calls Apalachicola home and specializes in the Apalachicola Bay system. He received special recognition from the Florida Fish and Wildlife Conservation Commission for “fostering an appreciation of Florida's fish and wildlife.” Visit www.johnspohrer.com to find out more about his work.


Our Partners

Our Photographers

John Moran is co-director of the Springs Eternal Project, which seeks to inspire Floridians to value, conserve and restore our precious waters. John would like to be a nature photographer who shoots only pretty pictures of Florida but reality keeps getting in the way. Learn more at www.johnmoranphoto.com.

A native Floridian, Carlton Ward is an award-winning conservation photographer who founded the Florida Wildlife Corridor campaign in 2010. His work has been published by Audubon, Smithsonian, National Geographic and others. For more information visit his website at www.carltonward.com.

John Spohrer calls Apalachicola home and specializes in the Apalachicola Bay system. He received special recognition from the Florida Fish and Wildlife Conservation Commission for “fostering an appreciation of Florida's fish and wildlife.” Visit www.johnspohrer.com to find out more about his work.

Florida’s Environmental Challenges

This report is the work product of deeply concerned members of the Florida environmental community who wish to help elected officials and candidates for office better understand six major statewide environmental issues impacting Florida’s natural resources and our residents’ quality of life. Reflecting that “one size does not fit all” this report also identifies four of Florida’s many resource areas meriting specialized treatment.

Every candidate for statewide office, the Legislature, and Congress should be aware of these major environmental issues and be willing to respond with decisive action.
Introduction

Florida’s environment provides both the foundation for this state’s quality of life and the cornerstone of its economy. Residents and visitors alike are attracted by the abundant opportunities provided by Florida’s beautiful rivers, springs, lakes, beaches, and wild and natural lands. Tourism officials market Florida’s distinctive lifestyle, economic development leaders promote it to attract new businesses, and residents enjoy the many benefits this lifestyle confers. In addition, Florida’s seafood industry is a major economic driver dependent on a healthy environment, and the state is the recreational fishing capital of the world. In 2014, Florida surpassed New York to become the third most populous state in the nation, with its 2016 population exceeding 20 million residents. In 2017 alone more than 116 million tourists visited Florida and, once again, this state is attracting in excess of 1000 new residents a day.

Trouble in Paradise

But there is trouble in paradise. As this state’s population continues to grow at a rapid pace, Florida’s aquifers – the source of our drinking water – are being overpumped, lakes and rivers are drying up, and spring flows are dropping. Water quality continues to decline due to poorly managed runoff from agriculture, development and septic tanks. Major discharges of polluted water from Lake Okeechobee, agricultural pollution, drainage canals and septic tanks in coastal counties flow into the St. Lucie and Caloosahatchee estuaries and the length of the Indian River Lagoon, leading to toxic algae blooms with significant health and economic impacts. Because of the redirection of historic flow from Lake Okeechobee, its fresh waters no longer flow south into the Everglades and Florida Bay as nature intended. Due to altered flows, salinity levels in Florida Bay, the St. Johns River, Apalachicola Bay and Florida’s other estuaries have changed with devastating impacts on the seafood industry, economy and traditional way of life.

Urban areas are in trouble as well. City streets in South Florida now routinely flood during high tide, disrupting daily life, requiring costly infrastructure retrofits, and threatening salt-water intrusion into the potable water supply. Sprawling new development not only eats up rural lands but also forces
taxpayers to pay more for roads, sewer and water services and other infrastructure that extends into the countryside. Crowded roads and schools increasingly are becoming the norm and will only worsen as our state welcomes more residents and visitors.

In recent years a number of programs, policies and funding sources designed to address these very problems have been seriously weakened or dismantled including eliminating the state growth management agency; cutting funding and staff for Florida's five water management districts once considered the most outstanding system in the nation; insufficiently enforcing the reduction of pollutants emanating from farms and dairies, lawns and septic tanks; reducing funding for municipal and county programs to address water pollution; and underfunding Florida's land conservation program – widely recognized as the best in the country – despite overwhelming voter passage of a constitutional amendment to restore historic funding to the Florida Forever program.

A Call for Visionary Leadership

Now more than ever, Florida needs strong and decisive leadership. The incoming Governor, Florida legislators and local officials have a tremendous opportunity – indeed obligation – to provide both the vision and leadership to bring about positive change, and soon. This requires a recommitment by all to support statewide and local programs, agency leadership and funding to:

• Acquire important natural lands to protect recharge areas for our drinking water, support significant areas of interconnected wildlife habitat and ecosystems, nourish fisheries and the full range of our immense wading bird populations, and recreation lands.

• Safeguard Florida's waters to ensure clean and abundant drinking water and sufficient supply to meet the need of the people, the environment, and agriculture.

• Plan for Florida's population growth to better protect natural lands, promote livable communities, and save taxpayer dollars.

• Address the increasing challenges brought on by the changing climate

Recognizing that one size does not fit all, specific programs, policies and funding need to be put in place and implemented to address the needs of special resource areas including the Apalachicola River and Bay, the Greater Everglades ecosystem, the Indian River Lagoon, and Florida's springs and springsheds.

To accomplish these goals, it is incumbent on the new Governor to hire and appoint respected leaders to top positions in state and regional agencies who understand the myriad issues facing Florida as well as the most cost-effective solutions. Agencies of critical concern include the Department of Environmental Protection, the five water management districts, Fish and Wildlife Conservation Commission, governor’s office, and state land planning agency. Likewise, incoming legislators must develop policy, legislation, and funding to deal with these serious issues facing Florida, and local leaders need to address these issues in their communities and regions.

This paper includes an overview of key issues and broad recommendations on how to move forward. While the challenges facing Florida are many, now is the time to chart a better, more sustainable course for Florida's future.
Statewide Priorities

In previous decades, Florida created some of the nation’s leading programs to conserve land and manage water supply and growth in one of the fastest growing states in the nation. Many of these programs evolved over decades, the result of years of visionary leadership, informed dialogue, skilled negotiation and successful compromise to develop workable programs that balanced the many often conflicting needs of humans, agriculture and the environment.

But in recent years, these and other statewide programs have been significantly weakened to the detriment of all Floridians. The groups signing on to this paper have identified the following statewide environmental priorities that need immediate and decisive focus by Florida’s new leaders:

- Conserving natural lands
- Safeguarding water supply
- Promoting water conservation
- Protecting and restoring water quality
- Managing growth
- Addressing climate change and community resilience

To restore and enhance these and other programs it is essential that Florida’s incoming leadership commit to:

- Appoint strong and effective leaders to head appropriate agencies
- Fully enforce environmental policies, laws, and rules already in place
- Pass legislation to restore and improve workable programs and address current and future challenges
- Provide sufficient funding for the agencies to accomplish their mandates

There is trouble in paradise. If Florida is to protect its quality of life and economy, it is incumbent upon this state’s new leadership to bring both the vision and the fortitude to address these challenges.
New residents and visitors alike long have trekked to Florida to enjoy its natural lands and waters. For many years Florida’s leadership responded by creating effective and accountable programs and authorizing funding to protect the most significant of these resources. But in recent years funding has languished to the detriment of all Floridians. With Florida’s population projected to grow to approximately 33.7 million residents by 2070 – almost 15 million more people than in 2010 – meaningful funding for land conservation is more important than ever.

Effective and targeted land conservation protects both the quality and sources of clean drinking water, provides flood control, conserves wildlife habitat, supports public health, maintains recreation opportunities, enhances community resilience in the face of rising seas, and protects our state’s long-term economic health.

**Land Conservation Programs**

Florida was once the national leader in state funding for land conservation. A nearly 60-year commitment to funding resulted in the purchase of lands protecting some of our state’s most iconic landscapes including springs, beaches, rivers, and most biologically important and threatened natural areas. Conserving a statewide network of interconnected lands and waters that include uplands, upland buffers and wetlands as well as fully functioning intact systems that include wetlands and uplands is essential. Since the establishment of the Land Acquisition Trust Fund in 1963, Florida policymakers and voters have repeatedly supported significant funding to preserve the state’s irreplaceable natural areas and provide beautiful places to enjoy and experience nature. That dedication to land conservation continued with the Environmentally Endangered Lands program in 1972, the Conservation and Recreational Lands (CARL) program in 1979, and the following more recent initiatives.

With the support of Governor Martinez, in 1990 the Legislature passed the landmark Preservation 2000 Act. This act authorized the sale of $3 billion in bonds, backed by the documentary stamp tax, over a ten-year period from 1991 to 2000. Through a suite of state programs including CARL, Save Our Rivers, Save Our Coasts, and Florida Communities Trust, Florida preserved almost two million acres of land for conservation and resource-based recreation.

In 1999, the Legislature passed the Florida Forever Act with the support of Governor Jeb Bush. Like its predecessor, Florida Forever authorized the annual sale of up to $300 million in bonds for ten years with documentary stamp taxes used to pay the debt service. Under Florida Forever there was a greater focus on urban and community parks, protecting water resources and water supply, and a new emphasis on purchasing conservation easements. Unfortunately, in 2008 the Florida
Legislature suspended funding for this program, with only minimal funds appropriated for state conservation land acquisition from 2008 to 2017. In 2018 the Florida Legislature allocated $100 million to Florida Forever, the most in nearly a decade, beginning a movement back towards historic funding levels.

With the Legislature not appropriating funds for Florida Forever, in 2014 Florida voters overwhelmingly approved—with a 75 percent majority—the Water and Land Conservation Amendment to the Florida Constitution. This change dedicated 33 percent of documentary stamp tax revenue to land conservation, management, and restoration for twenty years. In 2015 and 2016 the legislature appropriated millions of Amendment 1 dollars for other purposes. A circuit court recently sided with environmental groups that challenged this as unconstitutional.

In addition to the state funding programs above, many local governments responded by creating their own to provide match for state funds. Florida voters have consistently voted to raise public funds for local land conservation programs, even when it meant increasing taxes. Since 1988, Floridians have approved more than 87 city and county land conservation ballot measures creating $3.5 billion in local funding for preserving land.

Accountability

Florida’s conservation programs have an outstanding track record of spending funds wisely. Using the state’s existing successful programs as a model, objective criteria should continue to determine how funds are spent to keep politics out of the process. Florida Forever and its predecessor Preservation 2000, for example, have been the most successful state land conservation programs in the nation. The Florida Forever program provides a clear roadmap for investing in our conservation future, using science-based analysis and criteria and choosing the most efficient way to reap the desired results. A recent audit to identify possible conservation lands to surplus resulted on no land being proposed for a sale, a testament to the credibility of the selection process.

Recommendation

• Implement the intent of the 2014 Water and Land Conservation Amendment (Article 10, Section 28). Statutorily fully fund annually the Land Acquisition Trust Fund for the acquisition, and where appropriate, management and restoration of conservation lands.
Benefits of Land Conservation

Protect Drinking Water Quality and Supply—Increases in population and changes in land use due to increasing development pressure threaten our drinking water supplies by contributing to over-withdrawal from ground-water systems. Conserved land protects natural vegetation that filters pollutants from stormwater and allows precipitation to replenish ground water supplies. Pervasive development can cover large areas with impervious surfaces (such as roads and rooftops) which shunt runoff away from wetlands and other recharge areas. It is far cheaper to buy land or conservation easements on riparian properties than to restore polluted water or build water treatment plants.

Provide Flood Control—Flood damages in the U.S. cost billions each year. However, a protected floodplain contains no property to be damaged and acts as a permanent “safety valve” for flooding, reducing destruction to developed areas downstream. Communities across the nation are learning that building in floodplains is an invitation to disaster, despite expensive drainage systems. Acquiring floodplains provides for permanent flood protection and natural floodwater storage. Protected barrier islands, coastal marshes, and mangroves can reduce the damage of wave action and storm surges, no small consideration given Florida’s coastline and the tourist dollars generated by beachgoers.

Conserve Wildlife Habitat—Florida is home to about 120 federally listed endangered species, and many state-listed and/or imperiled species that become increasingly threatened as growth and development fragment natural lands and destroy habitat. Large areas of non-fragmented open space are important for wildlife that require large foraging areas. Contiguous core natural areas, rural open space, connected wildlife corridors greenways, and suburban and urban parks all play a role in encouraging diversity in plant and wildlife species.

Protect Florida’s Economic Health—Land conservation in Florida contributes to the economy in terms of jobs, taxes, tourism, and other revenue. Agriculture is our state’s 4th largest industry so helping farmers keep their land in production is key to our economic future. Open space and responsibly managed agricultural lands save communities costs in the form of decreased demand for roads, sewer and other community services. The market values of residential properties located near parks and natural areas are typically higher than those of comparable properties more distant from such public lands benefitting property owners through higher property values and local governments through an increased tax base. Preserving parks, open space, and working lands creates recreation opportunities for residents and visitors and generates revenue and jobs in the local economy. Overall, outdoor recreation generates $58.6 billion in consumer spending, $3.5 billion in state and local tax revenue, 485,000 jobs, and $17.2 billion in wages and salaries each year in the Florida.

Support Public Health—Research shows that people exercise more when they have access to parks. A study by the Centers for Disease Control (CDC) found better access to places to be physically active led to a 26.5 percent increase in the number of people who exercise three or more days a week. Even small amounts of exercise improve a person's health. Estimates are that 95 percent of U.S. adults, 92 percent of adolescents, and 58 percent of children don’t get the recommended amount of daily physical activity. Nearly 75 percent of citizens say parks, trails, and open space are an essential component of American health care.
Florida is facing a water supply crisis. Significant areas of the state have been designated as “water resource caution areas” with many springs, rivers, and lakes well below their historic healthy flows and levels. And as Florida’s population continues to grow, development-related water demand is putting increasing stress on the state’s already burdened water supply.

This comes at a time when Florida’s five water management districts have had their funding significantly reduced and the diversity and autonomy of their governing boards curtailed. To address current and future water supply challenges it is essential that funding and greater autonomy are restored and shortcomings in existing legislation are addressed. A finite resource, Florida’s natural waters must be better managed to more effectively balance the needs of people, the environment and agriculture.

Water Management Programs

Florida’s earliest water management entities were launched in the 1940s to address flood control. Recognizing the importance of protecting water resources across the state, in 1972 the Florida Legislature enacted the Florida Water Resources Act to address competing political, economic and ecological claims on Florida’s aquifers and surface waters.

The 1972 Act created five Regional Water Management Districts (Districts) with their functions and authority expanded by subsequent legislatures. The four core mission areas of the Districts often conflict. They include addressing regional water supply, water quality, flood protection and floodplain management, and natural resource systems. Each District has the authority to create 20-year Regional Water Supply Plans when it determines that there is not sufficient water supply to meet the needs of users, including natural resource systems. Each District also is required to establish Minimum Flows and Levels to identify the minimum amount of water needed to support an ecological resource such as a spring or river. But in recent years, considerable effort has been expended on developing such plans and programs – often without robust scientific basis – with insufficient emphasis on implementation.

Each District is controlled by a District Governing Board appointed by Florida’s governor. But there is no process in place to ensure that governing board members reflect the diverse values and core competencies needed to govern soundly. This leaves appointments more open to political interference which detracts from the ability of the Districts to foster trust and cooperation among competing interests.

The 1972 Act also established an administrative system to allocate water through Consumptive Use Permits (CUPs). To withdraw more than 100,000 gallons per day water users must obtain a
CUP from the appropriate water management district. The permit allocates a specific amount of water, for a specified period, under specific conditions. To be approved, a use must not interfere with an existing legal use and be “reasonable-beneficial,” which is defined as “the use of water in such a quantity as is necessary for economic and efficient utilization, for a purpose and in a manner which is both reasonable and consistent with the public interest.”

However, there are two major shortfalls. First, no uniform definition exists for “consistent with the public interest.” This has led to an overly generous interpretation that any gain in public welfare from the use, even indirectly through tax revenues, meets the conditions of the public interest test. This approach fails to incorporate the cumulative impacts – including public health, water resources protection, and the environment – of individual permitting decisions.

Second, there is no cost to withdraw water in Florida except the application fee and the cost to pump the water. Because there is no correlation between the amount of water used and the cost of water usage (including impacts to the public, natural resource systems, and other potential users) this system leads to an inefficient allocation of water. The 1989 Water Resource Commission developed a series of yet unimplemented recommendations including that water management districts “collect a fee from all users based on water used” with funds deposited into a Water Resource Trust Fund to aid in the development of alternative water sources (including conservation), resource protection activities, and incentives for water conservation.

In 1976 the voters of Florida approved an amendment to Florida’s Constitution to grant each District special taxing authority to levy ad valorem taxes (all but the Northwest Florida District are allowed to levy up to one mill) in part to ensure appropriate and reasonable stewardship of water resources at the regional level. But since 2011 each District has faced a dramatic reduction in budgets and workforces, severely curtailing their ability to operate effectively. For example, the South Florida Water Management District has seen its ad valorem tax revenue slashed by 32 percent from 2010 to 2017. Consequentially, the district lost 583 employees – 28 percent of its total workforce – during the same time. Similar reductions can be seen across Florida’s four other Districts. Due to the .5 mill ad valorem cap and millage rate rollbacks, the operations of the Northwest Florida District must be subsidized by Legislative appropriations, grants and cooperative projects to offset these shortfalls. The outcome is not an overall reduction in taxes for Floridians, but a diminution of regional responsibility, priority setting and stewardship in contravention of the 1972 Act. A number of fiscal and policy decisions best made by the Districts are now being made by the state Legislature through the appropriations process.
Recommendations

- **Appoint Diverse Governing Board Members.** Appointed members should reflect a broad diversity in values, background and expertise, including representatives from agriculture, conservation organizations, local elected officials, public water suppliers, and those with expertise in relevant fields. The appointment process should be updated to include greater input from stakeholders including the Agriculture Commissioner, Secretary of the Florida Department of Environmental Protection, local governments, the environmental community, and regional planning councils.

- **Restore Policy and Fiscal Autonomy to the Districts.** It is incumbent on the new Governor and legislators to depoliticize District budget and policy decisions by returning more authority to the governing boards. Further, governing board members should be encouraged to set ad valorem tax rates at levels which meet the needs of the resources today and prepare for the challenges of the future.

- For consumptive use permitting decisions, change the standard from “consistent with the public interest” to “clearly in the public interest.” The definition should include the factors to be considered when evaluating a consumptive water use, including public health, the extent of water and energy conservation, the long-term protection and sustainability of water resources, and the environment.

- **Appoint a new commission to develop recommendations on incorporating market principles into water allocations.** This group can suggest ways to implement the findings of the 1989 Water Resource Commission and explore other alternatives.
According to the 2016 study, Water 2070, if Florida’s current patterns of development remain the same, by 2070 development-related water demand will more than double. The study shows the single most effective strategy to lessen water demand is for individuals to significantly reduce the amount of water used, particularly for landscape irrigation. Not only does this conserve water, but it also will result in savings to homeowners through reduced water bills. But the public sector plays a key role as well. Significant water conservation is possible through a combination of expanded public sector measures and individual action.

Water Conservation Programs

Florida currently has programs to promote water conservation by individuals, but a more holistic approach is needed. Florida-Friendly Landscaping™ promotes the use of low maintenance plants and environmentally sustainable water practices to reduce or eliminate the need for irrigation. Florida Water Star is a water conservation certification program for new and existing homes and commercial developments which establishes water efficiency standards for indoor fixtures and appliances, landscape design, and irrigation systems. Compliance with these programs currently is voluntary, although Alachua, Citrus and Polk counties have adopted local rebate programs to encourage participation. Water conservation can be integrated more fully into other state initiatives as outlined in the recommendations, below, and in the Water 2070 report.

Education and incentives for the private sector are essential to encourage individuals to be more cognizant of the importance of curtailing personal water use. This can include using more sustainable gardening practices to reduce or eliminate the use of irrigation, and maintaining and upgrading irrigation systems and toilets, washers, dishwashers, showerheads and other indoor fixtures when necessary.
Recommendations

• **Develop a comprehensive public-sector approach to water conservation that combines baseline standards with incentives.** Measures include adequately funding Florida Friendly Landscaping and Water Star programs and establishing requirements and incentives so that new development and major remodeling better conserve water; updating the Florida Building Code to incorporate indoor and outdoor water efficiency standards for new construction and major remodeling; requiring appropriate training and licensing for irrigation installers; incentivizing lower levels of water consumption; and supporting the construction and incentivizing of reclaimed water facilities. Additionally, permitted water users, including agricultural users, and major developers should submit, implement and monitor goal-based water conservation plans.

• **Encourage and support private sector water conservation.** The above public sector recommendations should be used to create a comprehensive effort to educate the public on the need for water conservation and establish incentives and requirements to support reaching that goal.
Residents and tourists rightly expect safe and clean water for drinking, swimming, fishing and for our highly diverse water-dependent fauna and flora. But still, more than 2,100 water bodies in our state are deemed impaired and this does not necessarily include all of those that are contaminated. With alarming regularity water quality is in the headlines, from cyanobacteria in algae blooms in Lake Okeechobee streaming into estuaries, to red tide outbreaks in southwest Florida, to seepage from septic tanks flowing into once pristine springs. These issues pose increasing health risks, threaten our drinking water, impair Florida’s ecological health and have significant economic impacts by deterring tourism and recreation.

Nutrients – primarily in the form of nitrates and phosphorus – pose the single, most urgent and most intransigent danger to the health of Florida’s waterbodies. They are introduced into the groundwater by fertilizer and manure from agriculture and landscaping and urban stormwater, and seep from septic tanks which were used by approximately 1.6 million households in Florida in 2016. Not only does the introduction of nutrients threaten our drinking water, but also results in fish kills, death of wildlife, human respiratory problems and other harmful impacts.

**Water Quality Programs**

With the passage of the **Federal Clean Water Act** in 1972 and subsequent legislation enacted in Florida, regulations were put in place and enforced primarily to address “point source” pollution discharged from single sources such as municipal wastewater plants, power plants, phosphate processors and paper mills. This effort to establish and meet discharge levels to protect public health, protect recreational opportunities and balance the need of wildlife was at its peak in Florida from the 1990s through 2010.

Recognizing continued degradation of water quality throughout the nation, the Clean Water Act requires establishment
of **Total Maximum Daily Loads (TMDLs)** which identify the maximum amount of pollutants that a waterway can safely bear. This includes “non-point source” pollution caused by fertilizers, herbicides and insecticides applied to agricultural and residential lands; oil and toxic chemicals from urban runoff; sediment associated with construction sites, agriculture and erosion; and nutrients and bacteria from livestock and septic systems. When rainwater runs over the land it picks these pollutants up and deposits them into rivers, streams, lakes, sinkholes and coastal waters and, in Florida, may enter the aquifer, the source of our drinking water.

To meet federal TMDL requirements, the Florida Legislature directed the Department of Environmental Protection to create **Basin Management Action Plans (BMAPs)** for specified watershed basins. Each BMAP is different depending on the water quality issues, land uses, sources of pollution, hydrology and other unique features of the basin. BMAPs are supposed to identify the sources of pollution and responsible parties; how to reduce the pollutants; the monitoring system and implementation schedule; and funding sources.

Strategies to reduce pollutants may include requiring stricter permitting and/or improvements to wastewater and stormwater facilities, acquiring land, educating the public, enacting fertilizer ordinances, and other means. Some areas in South Florida have created and publicly funded **Stormwater Treatment Areas (STAs)** which have helped locally.

To assist with implementing TMDLs, the state also established **Best Management Practices (BMPs)** for agriculture to “conserve water and reduce the amount of pesticides, fertilizers, animal waste and other pollutants entering our water resources.” But BMPs are generally voluntary and have not been developed nor utilized in much of the state. Specialized required BMPs have been developed for Everglades Agriculture Area but likely will not be adequate to achieve water quality standards. But voluntary BMPs have not yet been developed for many watersheds and those established for a number of springsheds have not resulted in the desired reductions in pollutants. More stringent BMPs are needed to ensure that agriculture does its share to achieve compliance with numeric nutrient standards in springs and other impaired surface waters.

Currently, more than 30 BMAPs have been established or are in the process of development. Some BMAPs have been in place since 2008 while others, resulting from the **2016 Florida Springs**
Protection Act, have just been released for input. Thus far the studies are confirming that the contributors are the already well-established agriculture, lawn fertilizer, urban runoff and septic tanks with an average of 70 percent of the pollutants yet to be removed.

But with each passing year, new development, septic tanks, lawns and increased agricultural intensity increase pollutant loads and make the problem more difficult and costly to address. The time is now to start limiting the nutrients which flow to our lakes, rivers, estuaries and groundwaters. It is essential to move from the study phase to developing and implementing workable programs that include regulations to limit future pollution and sensible funding mechanisms such as a fee on fertilizers to correct existing problems.

**Recommendations**

- **Establish regulatory steps to achieve water quality standards.** DEP and the Department of Agriculture should be required to develop regulatory steps to insure compliance by responsible parties to achieve water quality standards on an expedited schedule following BMAP completion. Interim voluntary programs should be considered when allocating responsibility.

- **Increase funding and cost-sharing for water quality.** At the state level, the Legislature should enlarge funding and cost-sharing to assist communities in meeting their obligations to construct or upgrade sewage treatment plants and to incentivize the connection of households to central sewer systems where these contribute to significant nutrient problems identified in the BMAPs. As funding allows, cost-sharing to assist the private sector in meeting their pollution abatement obligations, such as agricultural BMPs, should be allocated based on the proposed treatments’ effect towards meeting water quality standards. Crop conversions or forest restoration projects could be considered for cost-sharing as well if more efficient.
As Florida returns to its historic growth rate of a thousand new residents a day – another City of Tampa each year – development pressures intensify, as do impacts to our lands and water supply. The pressures of dynamic population growth combined with rising seas comes at a time when Florida's state process to manage growth has been eviscerated. How Florida’s future governor, legislators and other state and local leaders respond to these increasing challenges will determine the quality of our communities and the ecological health of our natural lands for future generations.

In light of these challenges, how can Florida promote vibrant and livable urban communities and keep rural lands rural? In addition to meaningful land conservation as outlined earlier in this report, the key is to promote sustainable redevelopment in existing urbanized areas, accommodating more population on less land while taking into account the impacts of sea level rise. Promoting compact, walkable, mixed-use development in appropriate locations reduces the pressure to sprawl out into farmland, rural communities and natural lands. These practices help protect Florida’s lands and waters and support the state’s economy which is so dependent on these resources.

Growth Management Programs

Florida first began planning for growth in the 1970s, with the Legislature establishing Florida’s modern land use laws when it adopted the 1985 Growth Management Act. This put the state in the role of reviewing all local government comprehensive plans to ensure they complied with statewide standards. It also established the “consistency challenge” allowing courts to enforce local government compliance with their own land use rules when approving development proposals. The consistency challenge is the primary mechanism in Florida law for ensuring local governments comply with their own plans for growth.

More than a quarter of a century later, the Legislature adopted the 2011 Community Planning Act which significantly weakened Florida’s growth management process. It eliminated the Department of Community Affairs which had enforced the 1985 Act, transferring that responsibility to the Division of Community Development within the new Department of Economic Opportunity (DEO). The 2011 Act also reduced the state’s role in reviewing local government comprehensive plans, with most plans now going through an expedited review process that does not include any consideration of whether a plan amendment complies with state law. Only a small percent of comprehensive plans undergo state coordinated review which still includes evaluation for compliance and, in most of those cases, DEO defers to local governments.
Under the 2011 Act, affected persons (defined as certain impacted citizens, businesses and other local governments) may still appeal local government comprehensive planning decisions to the Division of Administrative Hearings (DOAH). But the courts use what is called the “fairly debatable standard” to evaluate such challenges. That standard is so deferential to the local government approving the amendment that it is virtually impossible for any challenger to prevail.

DEO likewise retained the right to challenge plan amendments using the more favorable “preponderance of evidence” standard based on what the majority of the evidence supports. But because in practicality the 2011 Act eliminated meaningful DEO review of amendments, this tool has not been used in recent years.

**Challenges**

The 2016 study, *Florida 2070*, reveals that if current patterns of development continue, by 2070 more than a third of Florida’s lands will be developed and development-related water demand will more than double. With more compact patterns of development and increased protected natural lands, more than 1.8 million acres of natural lands could be protected from development, with an additional 5.8 million acres of natural and agricultural lands conserved.

To protect the state's economy and water supply, Florida must once again take a meaningful role in managing growth, including reestablishing a department-level land management agency and strengthening the ability of the department and citizens to enforce growth management laws. It also should include a division to address the impacts and underlying causes of sea level rise. The new department must focus on incentives and investment strategies to promote more compact urban development including supporting infill and redevelopment that is sensitive to existing communities; promoting a mixture of homes, shops, schools and offices within close proximity; including a range of housing choices to ensure affordability; designing communities for multiple transportation options including walking, biking and public transportation; and protecting

---

**Florida 2070 Development Scenarios**

- **Statewide 2070 Baseline –** Existing development and conservation lands in 2010
- **Statewide 2070 Trend –** If current patterns of development continue
- **Statewide 2070 Alternative –** If more sustainable patterns of development are followed and significant lands conserved.

- Developed
- Protected
- Other

---

FOF 1115 - Trouble in Paradise Paper vFINAL.qxp_FOF 1115 - Trouble in Paradise Paper vFINAL#  7/31/18  8:53 AM  Page 21
significant historic and natural resources. In addition to curtailling sprawl, these measures also help save taxpayer dollars by reducing the need for costly infrastructure. Additionally, there needs to be greater recognition that transportation networks transform landscapes. Innovative transportation planning and design must be undertaken to avoid opening new areas to development, fragmenting habitat, and resulting in direct mortality of many species ranging from the Florida panther to gopher tortoises.

As the cornerstone of these strategies, Florida's next governor must create a meaningful state economic plan to guide the investment of state funds for infrastructure and conservation. This plan should identify lands on which urban development and redevelopment are appropriate and cost effective for Florida over the next 50 years and identify lands that must be protected from urban development to support our future population and Florida's economic base and quality of life. Appropriation of state funds should be focused on implementing this plan with infrastructure investments made only within urban areas to support economic growth and conservation investments made to protect land permanently for agricultural use, water quality protection, and wildlife diversity that are so critical to our economy, our livelihood and lifestyle. This will result in responsible private development investments that shape the future of Florida economy and communities and keep Florida special for future generations.

**Recommendations**

- **Elevate the state land planning agency to a separate, stand-alone department.** Within the department also establish a division responsible for addressing the challenges of climate change and sea level rise as discussed in the next section of this report.

- **Amend the Community Planning Act.** Require that the Division of Administrative Hearings reviews challenges to local government comprehensive plans using the preponderance of the evidence standard. Clarify that the consistency challenge is always available to enforce local government land use decisions being consistent with applicable law. Require state coordinated review for a greater proportion of comprehensive plan amendments. Ensure the provision of technical support to local governments so that their comprehensive plans comply with these statutory standards.

- **Adopt a state economic plan to guide the investment of state funds for infrastructure and conservation.** This plan should be drafted by the state land planning agency in collaboration with the Department of Transportation, Department of Environmental Protection, Water Management Districts, local governments and advocacy groups, and will: identify lands on which urban development and redevelopment are appropriate and cost effective for Florida over the next 50 years; identify lands that must be protected from urban development to support our future population and Florida's economic base and quality of life; and, focus the appropriation of state funds on infrastructure investments only within urban areas to support economic growth and conservation investments to protect land permanently for agricultural use, water quality protection, and wildlife diversity.

- **Increase state support for walkable development by supporting transportation systems that provide alternatives to the automobile.** Promote and fund high-quality regional transit systems and an intracity passenger rail network. Give local governments greater ability to locally fund infrastructure improvements such as walkable streets and transit through strategies like higher local-option gas taxes, taxes on parking, or municipal sales surtaxes for transportation.
Climate change – particularly the warming of our atmosphere, oceans and lands – poses immediate, near-term, and long-term challenges for the people, communities, and economy of Florida. These challenges include sea-level rise, loss of agricultural productivity, flooding and drought, increasingly severe and violent weather events, changes to the water cycle, and ecological changes caused by changes in temperature. Sea-level rise in calm weather is already a nuisance in South Florida where sunny-day flooding happens during “king tides.” Higher ocean level also means higher storm surges and more serious flooding during storms as well as increased saltwater intrusion in coastal aquifers.

We have yet to learn of all the impacts climate change will have on natural systems, but examples include the northward migration of mangroves in Florida due to fewer freezes and increased salinity, coral bleaching from warmer ocean waters, and ocean acidification due to the absorption of carbon dioxide which threatens the oceanic food web. We need to prepare for the effects climate change is having on pollinators and crops, the overall water cycle that provides the freshwater we all depend on, and on disease vectors such as mosquitoes. Addressing community resilience and climate change in a proactive manner not only prepares this state for future challenges but also will result in more livable communities and long-term economic savings for taxpayers.

With approximately 75 percent of this state’s population in counties lining the coast, Florida must prepare for the increasingly severe weather and sea-level rise caused by climate change. Using NOAA research, the online real estate database company Zillow projects that a six-foot rise in sea-level by 2100 would cost Florida $413 billion in property losses. It is essential that Florida establish policies that reduce the state’s vulnerability and increase its resilience and adaptability.

It is also imperative that Florida do its part to address the causes of climate change. The scientific consensus is that climate change is caused by human activity, largely due to burning fossil fuels that release carbon dioxide into the atmosphere where it acts as a ‘blanket’ that retains some of the heat radiated from the surface of the earth instead of letting it escape into space. Greenhouse gases absorb infrared radiation and then re-emit it, warming the atmosphere, oceans, and land surface. The increased temperature, in conjunction with other factors, is causing and will continue to cause increasingly severe weather events, sea-level rise, impacts on the water cycle, and changes in local ecologies.

Climate change has been accumulating momentum for a long time and it will take a long time to stop the current temperature increases, much less reverse them. There is no quick and easy fix, but these impacts can be reduced and reversed. Florida must lead on reducing carbon; it threatens the state’s existence. Investment in renewable energy doesn’t require pipelines or result in greenhouse gas emissions.
Florida’s next governor and incoming Legislature should establish the state as a leader, both by setting policy to significantly reduce greenhouse emissions to help eliminate the major cause of climate change, and by adapting our economy (particularly agriculture) and our communities so we can continue to thrive as our climate changes.

**Recommendations**

- **Make Florida’s communities more resilient.** *Prevent damage:* Require, as a condition of doing business, the hardening of stormwater treatment plants, power plants, and other potential sources of pollution against damage from sea-level rise and natural disaster. Move development away from areas vulnerable to the impacts of severe weather, and conserve and protect buffering wetlands with strict permitting standards and enforcement. *Equity and Inclusion:* Ensure low-income communities have the resources and help to implement resilience strategies. *Invest:* Fund unbiased research on future impacts on the state’s agriculture, water cycle, aquifers, flora and fauna, to provide a foundation for future planning.

- **Use planning strategies to reduce greenhouse gas emissions.** *Transportation:* Make growth management and land use choices that reduce automobile dependency and incentivize compact transit-oriented development. Co-locate mass transit in existing transportation corridors to foster urban density. Protect wildlife habitat from fragmentation by roads and provide corridors for wildlife migration. Limit paving to preserve aquifer recharge areas. *Development:* Incentivize walkable communities and green building practices for residences, businesses, and industry.

- **Use economic strategies to reduce greenhouse gas emissions.** Require the Public Service Commission to prioritize and improve supply-side and demand-side energy efficiency. Institute a Renewable Portfolio Standard that specifies a minimum required percentage of renewable energy, and advocate for expanded investments in solar and wind energy to achieve it. Facilitate distributed generation and other innovations in the electrical grid. Require the social cost of carbon to be included in energy policy decisions. Decouple power company profits from sales and link them to improved service, reduced emissions and better water use. Define future investment in fossil fuel infrastructure as imprudent. Put the energy office back in the Department of Environmental Protection; regulate to reduce carbon dioxide and other greenhouse gas emissions and purchase mineral rights from current owners of properties extracting fossil fuels.

- **Undertake administrative changes to reduce greenhouse gas emissions.** Promote higher energy efficiency standards in the Building Code and other rules. Reduce use of fossil fuels and other sources of greenhouse gases (e.g., use anaerobic digestion for biodegradable solid waste to generate methane to be used for energy). Encourage the development and expansion of EV charging infrastructure and the use of EVs by cities, counties, and businesses – particularly those that run regular routes or in territories where overnight charging is easily available. Expand tax incentives and rebates for electric vehicles, improve local government parking policies, and ensure EV owners can responsibly install and use charging equipment, HOA and condo rules notwithstanding. Facilitate EV charging investments at multi-family properties. Oppose hydraulic fracturing, acid fracturing, and acid matrix stimulation for natural gas and oil in Florida and oppose new extraction of fossil fuels in the state and off-shore.
This section includes information on four of Florida's many special resource areas. Addressing the state's six policy priority areas – discussed in the previous section – will go a long way in helping to resolve problems in each of these areas. But recognizing that “one size does not fit all,” this section includes issues and recommendations specific to each of the following resource areas:

- Apalachicola River and Bay
- The Everglades
- The Indian River Lagoon
- Springs and Springsheds

Each of these areas – along with many others across the state – are shaped by the confluence of land and water. And each has been impacted by decades of efforts to accommodate development, allow agriculture, control flooding, or other purposes. These efforts to “tame” natural systems for human use have altered historic water flows, often with devastating results for the associated marine and terrestrial life as well as the regional quality of life and economy.

Additionally, the impacts of the resulting development and agriculture on these and other special resource areas are many. These include the introduction of fertilizers and pesticides, along with human and animal waste, to the natural waters from runoff from farms and homes. This adds nutrients and chemicals that disrupt the natural balance needed to support marine and terrestrial life. Homes and farms also siphon off water, further contributing to the decline of the ecosystems.

The resources highlighted here are but a few that merit attention. For example, Florida’s Gulf Coast faces issues of degraded water quality, loss of habitat, failure of iconic fisheries, and coastal erosion. As with the Indian River Lagoon, the Caloosahatchee drainage basin and associated estuaries also are negatively impacted by massive Lake Okeechobee discharges during wet conditions, and during dry periods suffer from insufficient flows. Florida Bay likewise has suffered from massive sea grass die offs due in part to insufficient clean freshwater flows. In central Florida, the Ocklawaha River was dammed in the 1960s, impeding its natural flow. At the northern end of the state, the St. Johns River and its tributaries are impacted by excess nutrients, water withdrawals, sedimentation, habitat loss and degradation, wetland impacts and more. These and many more special resource areas across the state also deserve attention by Florida’s leaders.

This section is intended to show that in addition to dealing with the six state-wide priority issues, more specific programs and policies must be tailored to meet the unique conditions and needs of Florida’s many special resource areas. This is essential if Florida is to maintain its quality of life and economy, both of which are so dependent on a clean environment.
Florida needs effective leadership to reverse the poor and still declining condition of the Apalachicola River ecosystem, and the economic, social, and cultural well-being of Florida citizens who depend on it. The ecosystem encompasses the Apalachicola River, its surrounding floodplain, Apalachicola Bay, and Gulf waters over 250 miles offshore. It supports recreational and commercial fisheries worth over $8 billion and 80,000 jobs to west Florida.

The Apalachicola River is recognized internationally as an extraordinarily productive resource both biologically and economically. It supports diverse fisheries (both freshwater and saltwater) as well as industries such as Tupelo Honey production and commercial timber harvesting. Entire communities in Florida depend on the system for their livelihoods. The resource is in imminent peril because of insufficient flow in the River. The effects of low flow have been compounded by management actions of the U.S. Army Corps of Engineers that alter the natural timing of flow, disconnect and dry out the floodplain swamps, and starve the Bay of nutrients.

The 106 miles of the Apalachicola River lie entirely in the state of Florida. However, 80 percent of the River’s watershed lies in the state of Georgia, in the basins of the Chattahoochee and Flint Rivers. In those basins, water that would otherwise flow into the Apalachicola is diverted, stored, and consumed. The economies of the cities of northern Georgia and the expanding irrigation-dependent agriculture of southern Georgia operate at the expense of the Apalachicola River and Bay. Combined they have reduced the flow in the Apalachicola to historically low levels, greatly diminishing biological productivity, which in turn diminishes economic productivity. Florida communities along the River and around the Bay are suffering significant economic and social hardships.

The flow to the Apalachicola River is highly impacted in Georgia, primarily by agricultural irrigation and mismanagement by the U.S. Army Corps of Engineers. The Corps controls multiple locks, dams, and reservoirs on the Chattahoochee River, which makes up half the watershed that flows out of Georgia. The Corps considers only endangered species and insists that it has neither
obligation nor authority to consider the well-being of the Apalachicola River ecosystem, nor the plants, animals, or Florida citizens and businesses that depend upon it. Especially during drought periods, the Corps retains water in the reservoirs to support burgeoning development and growth in Georgia and this is being aggressively supported in Georgia at local, state and federal levels.

The other major source of water flowing out of Georgia is the Flint River, fed by underground aquifers which are being relentlessly tapped to supply agricultural irrigation in southwest Georgia. Florida requested that the Supreme Court cut Georgia’s irrigation by 50 percent to alleviate the consequences of flow reductions to Apalachicola River and Bay.

The negative consequences of insufficient flow are clearly seen in marine fisheries data. Until recently, Apalachicola Bay produced 90 percent of Florida’s oysters and more than 10 percent of the nation’s oysters. Significant fisheries for shrimp, finfish and crabs existed as well. In 1984, Apalachicola ranked as the 33rd largest seafood port in the U.S. (by dollar value). In 2012, with low flow in the River, ecological productivity crashed, and the fishery collapsed. A Federal Commercial Fishing Disaster was declared in August of 2013. In 2015, Apalachicola’s rank had fallen to 89th among U.S. ports. Oyster-harvester and seafood industry jobs plummeted. Social upheaval in the communities around the Bay has displaced families and driven poverty to historic highs.

Many years of litigation have thus far failed to improve the situation. With Florida v. Georgia, the U.S. Supreme Court recently sent the case back to a special master, giving Florida another chance to make the case it deserves more water for the River and Bay.

The plight of the River system and the Floridians who depend upon it requires better water management by government agencies in both Florida and Georgia, and by the Corps of Engineers. Change at the federal level will not come about without Congress making changes to the Water Resources Development Act. Changes in management will not occur without effective leadership at the highest levels of Florida state government.

**Recommendations**

- **Pursue regional cooperation.** Bring effective political pressure to bear on the Corps and Congressional delegations (Georgia and other states). Establish a Transboundary Watershed Management Entity to foster collaborative action between the States and Federal government to manage the waters of the ACF Basin. Develop a Basin-wide Apalachicola Watershed Management Plan in cooperation with local governments and stakeholders along the River and Bay. Pursue appropriate legal intervention where necessary.

- **Implement resource-specific environmental solutions.** Implement actions to restore the hydrology and water quality in the River and floodplain swamps. Continue the effort to restore productive oyster habitat in Apalachicola Bay that rebuild oyster beds, improve productivity and provide employment for oyster workers. Continue the state’s effective effort to preserve the ecological integrity of the system by acquiring conservation easements and lands in fee-simple in the watershed using Florida Forever funding.
The Greater Everglades stretches 18,000 square miles from the Orlando area to Florida Bay. Historically, rain that fell near what is now Disney World would find its way into the Kissimmee River which meandered for 103 miles to Lake Okeechobee. During high rainfall periods, water from the Lake would overflow into the swamps and vast sawgrass marsh to its south and slowly make its way to the Atlantic Ocean, Florida Bay, Biscayne Bay and the Gulf of Mexico.

More than 150 years of active efforts to “reclaim” the Everglades for development and agriculture – including channelizing the Kissimmee and Caloosahatchee rivers, extensive drainage of land, and the construction of the Hoover Dike – have had devastating results for the entire ecosystem. Highly polluted waters from farms and development flow into the liquid heart of the Everglades – Lake Okeechobee – and then during high water periods are discharged through the St. Lucie and Caloosahatchee Rivers. With Lake Okeechobee experiencing another massive algae bloom in the summer of 2018, devastating results are once again apparent in the estuaries. To the south, farming in the Everglades Agricultural Area further adds to water quality problems.

Everglades Reclamation and Restoration

Even before Florida became a state in 1845 there was talk about “reclaiming” the Everglades for development. Serious efforts began in the 1880s when Congress commissioned a study on reclamation and, with support of the state, partially channelized the Kissimmee and Caloosahatchee rivers and constructed other canal and levee works.

By the 1920’s, sugar and vegetables were being grown in the rich muck land south of Lake Okeechobee. In the late 1920’s, two powerful hurricanes hit South Florida, destroying the dike and killing more than 2,400 people. This led to the construction of the Hoover Dike, completed in 1938 by the U.S. Army Corps of Engineers.

Following extensive damage from two hurricanes in 1947, the Corps developed the Central and Southern Florida Project which
included a protective levee along the east coast, three water conservation areas, creation of the 675,000 acre-Everglades Agricultural Area (EAA) south of Lake Okeechobee, and more than a thousand miles of levees and canals. A 50-50 cost share was established whereby the Corps would be responsible for building the project and the state would provide the land and maintain it. In 1949, the Central and Southern Florida Flood Control District was established as the local sponsor of the federal project.

Due to increasing concern about protecting the environment, in 1983 Florida enacted the Save Our Everglades program. Between 1983 and 1996, Kissimmee River restoration commenced, Big Cypress National Preserve expanded by 146,000 acres, Everglades National Park expanded by 108,000 acres, the Florida panther population increased, and steps had been taken to help clean up Lake Okeechobee. Thousands of acres of stormwater treatment acres were planned for construction. The state realized that more formal federal involvement and funding would be required. In 2000, Congress approved the Comprehensive Everglades Restoration Plan (CERP). The CERP initially included 68 projects at an estimated cost of $7.8 billion with a 36-year completion date. The latest cost estimates exceed $17 billion.

While significant accomplishments have been made, Everglades restoration has a long and difficult journey ahead. Fifty percent of the Everglades has already been lost to agriculture and urban uses. Demands for flood protection and water to supply South Florida’s ever-growing population will inhibit restoration success.

**Lake Okeechobee**

Phosphorus enters Lake Okeechobee at 4 to 5 times the annual goal. Sources include runoff from fertilizers used on sugar and other agricultural lands, cattle waste from dairy farms, and human waste from septic tanks and wastewater treatment plants. The Best Management Practices (BMP) program intended to encourage agricultural operations to abate and avoid pollution has been a failure due to lack of funding and proper oversight.

About 90 percent of the waters come into Lake Okeechobee from the Kissimmee River and northern watershed. The South Florida Water Management District (SFWMD) and Corps are working to develop water retention (cleansing) areas in the northern watershed, but more action is necessary to address pollution at the source. Agricultural and urban stormwater discharges to the lake from the
south are also sources of pollution. During extreme high-water events, water is back-pumped into the lake to prevent urban flooding, protect downstream wildlife, and protect sugar cane and other crops in the EAA.

During high water periods, high volumes of poor quality water are discharged from the Lake to the St. Lucie and Caloosahatchee rivers causing devastating damage to the east and west coast estuaries. This polluted freshwater disrupts the delicate ecological balance in the estuaries, making the water toxic to humans and killing off large numbers of marine mammals, birds, and fish. Completion of the C-44 and C-43 retention areas are expected to reduce discharges and damage to the estuaries. In addition to the EAA reservoir authorized by the Legislature, the SFWMD and Corps are currently designing additional retention measures to reduce discharges from the lake.

Water no longer naturally flows into the Water Conservation Areas but is sometimes discharged into them during high water events when the conservation areas are typically full, endangering wildlife and tree islands. Flow of the water from Water Conservation Area 3 into Everglades National Park is inhibited by the Tamami Trail which acts as a partial dam. While wildlife on the north side of the Trail is literally drowning, on the south side, Everglades National Park and Florida Bay suffer from a lack of fresh water. Bridging Tamiami Trail is under way and other plans are being developed to allow water to flow into the Park and Bay.

Despite a long history of abuse, progress is being made in restoring what’s left of America’s Everglades. Below are actions that could further move restoration in the right direction.

**Recommendations**

- **Advocate for federal action.** Urge the president and Congress to adequately fund CERP in a consistent and timely manner with emphasis on water retention and cleansing projects in the EAA and areas north of Lake Okeechobee, completion of the C-44 and C-43 projects, and the expeditious acquisition of the Everglades Headwaters National Wildlife Refuge.

- **Provide strong state and district leadership and necessary funding.** Appoint a DEP secretary and SFWMD governing board members who are committed to restoring the Everglades. Encourage the SFWMD to levy sufficient ad valorem taxes, as provided by the law, that will enable it to adequately carry out its mission without relying on state general revenue and other state funds. Develop an enforceable regulatory program to protect water quality in the entire Everglades.

- **Complete ongoing projects and initiate new ones.** Ensure that the South Florida Water Management District, with the cooperation of the Corps, completes the reservoir in the EAA on schedule. Urge expeditious completion of current bridging and additional hydrologic improvements to Tamami Trail to allow more water to flow into Everglades National Park. Particularly north of the Lake, develop a water retention system of sufficient capacity to help alleviate discharges from Lake Okeechobee to the estuaries, and to allow more clean water to flow through the Everglades when the water conservation areas are not over schedule. State and federal government own significant acreage in the greater Everglades and through purchases and swaps, a better system can be developed.
The Indian River Lagoon (IRL) is one of the major recipients of polluted waters from Lake Okeechobee. A shallow, narrow “Estuary of National Significance,” it extends 156 miles along Florida’s east central coast between Jupiter Inlet and Ponce Inlet, encompassing Palm Beach, Martin, St. Lucie, Indian River, Brevard, and Volusia counties. More than 76 percent of its 1.7 million residents live within a few miles of the lagoon. Approximately 7.4 million tourists visited the area in 2015, and more than 10 million are projected in 2025.

Because it is in a transition zone between temperate and tropical regions, it is one of the most biologically diverse estuaries within North America, with more than 4,300 species of plants and animals. It supports a coastal industry-based economy valued at $7.6 billion annually in 2016, and the region’s appeal and extraordinary quality of life. Due to its hydrology, water remains in the basin for long periods of time. This, coupled with widespread land-use changes and human population growth, has increased the problems of nutrient pollution and eutrophication in the IRL.

**Land Use and Nutrient Pollution**

The IRL watersheds have experienced dramatic change in land use over the past century. With canals constructed to drain uplands for agriculture, reduce flooding, and control mosquitoes, the IRL watershed has nearly tripled from the original 573,000 acres. These changes greatly altered the hydrology, resulting in increased stormwater discharges into the IRL.

This has been greatly exacerbated by the periodic large-volume freshwater discharges from Lake Okeechobee following heavy rainfall associated with summer storms, hurricanes, tropical storms, and El Nino events, and disrupts the estuarine ecology. The associated low salinity contributes to the loss of oysters, clams and seagrasses, exacerbating the nutrient-enhanced blooms of the toxic cyanobacterium Microcystis in the summers of 2005, 2013, 2016 and 2018.

Growing nutrient pollution increases the frequency and intensity of harmful algal blooms, leading to low to no oxygen in the water, toxins, seagrass decline, fish kills, and noxious odors. Nutrient sources include fertilizers, wastewater treatment plant overflows, septic systems, basin runoff, and precipitation.

The impacts are especially evident in the St. Lucie Estuary, where recent analyses suggest the bulk of phosphorus and nitrogen come from the St. Lucie watershed itself. However, 20 to 30 percent of the average annual loading comes from emergency Lake Okeechobee discharges and during the rainy season are a significant source.
While agriculture as a land use is diminishing, pressure to increase productivity continues. The watersheds have also become increasingly urbanized. Since 2010, urban fertilizer ordinances have reduced residential fertilizer inputs in Brevard County by approximately 80 percent, but sewage remains a major source of nutrient pollution in the Northern IRL. This supports harmful algal blooms, with health advisories for fecal contamination increasingly common.

Following the 1990 designation of the IRL as a National Estuary Program, most sewage outfalls were phased out, but many plants do not meet water quality standards in part because they cannot manage current loads in the Northern IRL. There is a continued heavy reliance on septic systems, with between 300,000 and 600,000 in the basin. These are increasingly a source of nitrogen and fecal pollution in portions of the estuary, with certain tracing studies documenting widespread pollution of ground and surface waters associated with high densities of septic systems.

The cumulative negative impacts of engineering, heavy rainfalls, septic tanks, failing sewage systems, agriculture, and urban runoff are apparent in the emergence of “super blooms” in 2011 and a “brown tide” in 2012. Unusual Mortality Events involving endangered manatees, dolphins, and pelicans occurred in 2013, and brown tides again in 2016 and 2017. Highly toxic algae blooms are emerging in a number of waterbodies in 2018.

Approximately 95 percent of the sea grasses have been lost from the northern and central IRL, probably due to light limitation from increasing algal blooms and chlorophyll. Long-term studies of IRL marine mammals have demonstrated high body burdens of contaminants including mercury. Preliminary data demonstrate the potential for increased human health risk from mercury and consumption of IRL seafood. The Department of Environmental Protection’s proposed Basin Management Action Plans, even if totally implemented, would only reduce the inputs to the Lake Okeechobee watershed by approximately one third of that needed to assure water quality standards.

**Recommendations**

- **Meet water quality standards.** Enforceable plans must be developed to actually achieve water quality standards within the Lake Okeechobee and St. Lucie Estuary basins, as increasing freshwater stormwater runoff and continued emergency discharges from Lake Okeechobee are likely to increase incidences of devastating algal blooms.

- **Provide essential water storage.** Create additional freshwater storage both south and particularly north of Lake Okeechobee because even when the dike is repaired important marshland habitat around the lake will be flooded. Give priority to storage systems which can also biologically remove nutrients.

- **Address wastewater.** Develop a master wastewater plan for counties in the IRL watersheds that identifies “hot spots” and includes expanded capacity, new sewage collection technologies, and advanced waste treatment to reduce effluent concentrations. Urge the Governor and Legislature to secure long-term matching funds to upgrade wastewater infrastructure as undertaken in the Florida Keys. Urge the Governor to implement a moratorium on new septic tank installations unless appropriate standards are met. Develop pump-out facilities at marinas and establish a “No Discharge Zone” throughout the IRL.
Springs and Springsheds

Florida's springs are a barometer that reflect the health of the state's underground water supply. Throughout the state, our springs are suffering an overall long-term decline in flow volume and an overall increase in pollution. Groundwater pollution primarily takes the form of nitrate nitrogen introduced into groundwater due to animal and human waste and the application of fertilizers. The long-term reduction in the flow of springs is caused by excessive groundwater use for agriculture and urban development. Many springs, including iconic Florida landmark springs such as Silver and Rainbow springs, have suffered alarming declines in flow and equally alarming increases in nitrogen pollution.

Florida has more than a thousand springs, with 33 first-magnitude springs – the greatest concentration of large springs in the world. First-magnitude springs have average historic flows of at least 65 million gallons per day. Important springs and large spring groups include Silver, Wakulla, Crystal River, Ichetucknee, Weeki Wachee, Homosassa, Chassahowitzka, Rainbow, Volusia Blue, and Wekiwa. Visitation numbers at springs are influenced by clear, cool water and attractive plants and wildlife. Annual visits to the 100 largest springs in Florida are estimated at more than seven million people, with an annual economic value between $300 million and $1 billion. But springs become less attractive to visitors when the flow and water clarity are reduced and when excessive floating vegetation and filamentous algae predominate.

Challenges

Springs are most common in north and central Florida where fresh water from rainfall has filled the porous limestone of the Floridan Aquifer. As water filters through the limestone it creates cavities and, if the overlying rock collapses, a spring or sinkhole emerges. The springsheds – or basins from which springs derive their waters – are often known as karst landscapes.

Each of Florida's springs faces unique challenges. For example, twenty Florida springs are inundated beneath the Rodman Pool – which was created by flooding the Ocklawaha River to make way for the abandoned Cross Florida Barge Canal. However, all of Florida’s springs and the springsheds that sustain them face two common challenges – competition for the limited amount of fresh groundwater that is needed to support
both humans and springs, and excessive nutrient pollution of the groundwater that feeds the springs and nourishes their diverse wildlife resources. Both stresses interact and disrupt the springs’ delicate ecological balance, submerged aquatic vegetation, and fish and other wildlife dependent on abundant and clear spring waters to thrive.

In terms of groundwater quantity, humans are in direct conflict with springs for a limited resource. Every gallon of fresh groundwater used by humans is one less gallon available for nourishing Florida’s springs. Domestic water uses, ranging from flushing the toilet to watering the lawn, use groundwater. So do agricultural and commercial uses, including extracting and bottling spring water. Public water supply wells also draw from the groundwater needed to maintain healthy spring flows.

The second major challenge is the introduction of pollutants into our principal water supply – the Floridan Aquifer. Soils in karst landscapes are often sandy, meaning that rain and wastewater pass through rapidly and carry any dissolved pollutants placed on the land surface such as nitrate nitrogen and various synthetic pesticides. In karst areas pollutants enter the aquifer more rapidly than in areas with heavier, more compacted soils. For springs located in rural areas, agriculture is the most impactful due to fertilizers, herbicides, insecticides, and animal waste. For springs in more developed areas, pollution associated with runoff from lawns, roads and driveways and insufficiently treated human waste from septic tanks pose the greater problem.

Fertilizers and animal and human waste all are high in nitrogen. Studies conducted by the Florida Department of Environmental Protection in numerous springsheds have found that the concentration of nitrate nitrogen throughout much of the Floridan aquifer is elevated above the natural background concentrations by more than 20 times, and by more than 200 times in some localized areas that have more than 10 parts of nitrogen per million which violates the Environmental Protection Agency’s drinking water standard.
Not only does nitrogen harm our drinking water supply, it also impacts the many organisms dependent on these springs. The Florida Department of Environmental Protection has determined that nitrate concentrations just seven times above the natural background are harmful to springs biota. High nitrogen levels result in mats of noxious filamentous algae which block out the sunlight and cause the natural vegetation to decline or die. This makes springs vulnerable to exotic vegetation invasion and reductions in food-chain support of healthy fish populations. This is exacerbated in springs that experience high use for recreation or boating, so additional measures are needed in many springs to address these impacts.

Florida enacted the **2016 Springs Protection Act** which relies heavily on the creation of Basin Management Action Plans (BMAPs) to protect water quantity and quality in the springs. But as noted earlier, this process has serious flaws. As an example, the Santa Fe River Basin BMAP was created in 2012 which documented the pollution sources, set goals and provided voluntary recommendations. These included Best Management Practices (BMPs) for agriculture, the biggest contributor to nitrogen pollution in the basin, and recommendations on how industry, lawn care and golf course providers, and power plants could curtail their polluting. These recommendations were voluntary with no timeline for implementation or penalties for non-compliance. Unsurprisingly, a recently completed study of the Santa Fe and its feeder springs demonstrated that nitrogen content continues to rise despite implementation of BMPs.

**Recommendations**

- **Re-establish the Florida Springs Initiative.** Include enforceable standards, requirements for routine monitoring and springs health assessments, strict enforcement of existing laws, and adequate funding for full springs restoration.

- **Acquire critical conservation lands in the springsheds.** Springs are the end of the pipeline and their direct purchase alone is not enough to protect them from harm. Use Amendment 1 funding to acquire and protect the most vulnerable and significant conservation lands in springsheds.

- **Engage in aggressive water conservation.** Reduce the amount of groundwater extractions permitted throughout north and central Florida to maintain healthy spring flows. As outlined in the Water Conservation section of this report, establish strategies to require new development and major remodeling to follow standards established under Florida Friendly Landscaping™ and Florida Water Star. Provide incentives to replace existing landscaping with drought tolerant plants that do not need irrigation.

- **Dramatically reduce the amount of nutrients introduced into the springsheds.** Reduce or eliminate the use of nitrogen-based fertilizers that contaminate groundwater in springsheds. Prohibit the installation of any new septic tanks on parcels less than five acres. Replace all septic tanks on smaller properties with nitrogen-removing central sewer systems. Where septic tanks are too scattered to be replaced by regular gravity sewer systems, build smaller “pressure sewer systems.” Limit densities of livestock as needed to meet the spring nitrate standard of 0.35 mg/L in the underlying groundwater. Improve practices for treating municipal, agricultural and commercial wastewater reuse and disposal in springsheds.

- **Manage recreation impacts on springs.** Develop science-based management plans that insure compatibility between appropriate recreational activities and sustainable ecological communities.
A Clarion Call for Leadership

It is our collective hope that Trouble in Paradise will help guide Florida’s leaders on the path to a cleaner, healthier environment. If Florida is to continue to prosper for generations to come, we need to protect natural lands to cleanse our drinking water and the air that we breathe. We must ensure a sufficient and clean supply of water to meet the needs of humans, the environment and agriculture through better management and conservation strategies.

As Florida grows to a projected 33.7 million residents by 2070 – almost 15 million more people than in 2010 – we must build vibrant and livable communities to accommodate new residents and visitors, and conserve natural areas to shelter wildlife and nurture our souls. And Florida must position itself to address the many challenges looming ahead, including sea level rise and climate change.

This paper outlines but a few of the many major environmental issues that demand attention – and resource areas meriting protection – in our beloved Florida. It comes through loud and clear that, in many cases, effective programs exist that have evolved with decades of bipartisan involvement and refinement. But these programs must be sufficiently funded, appropriately led, and fully implemented. In other cases, innovative new approaches, additional sources of funding, committed agency heads, and the resolve to ensure and require implementation are essential to better protect Florida’s lands and waters.

Now more than ever, Florida needs strong, bold, and decisive leaders. Leaders with vision and dedication. Leaders with the best interests of Florida at heart. Our quality of life and Florida’s very economy depend on it.
Top right, middle left and middle back cover photos by John Moran Photography; Bottom right photo by Carlton Ward Photography.