The Spread of Fertilizer Ordinances in Florida[1]

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I. Introduction

Fertilizer composition and use has important implications for coastal resiliency. The concept of coastal resiliency has received increased attention in recent years in the context of climate change.[5] Coastal resiliency refers to a given coastal system's adaptive capacity to external disturbances. That which enhances the ability of coastal ecosystems to prevent or cope with the impacts of external disturbances is understood as having a positive impact on coastal resiliency. Resiliency can be strengthened mainly by decreasing the probability of occurrence of coastal hazards or avoiding or reducing their potential effects.[6]

Harmful algal blooms (HABs) are a specific coastal hazard that have received increased attention over the past decade. Algal blooms involve high concentrations of photosynthetic algae, cyanobacteria and non photosynthetic protists.[7] HABs are a subset of algal blooms that cause harm by releasing toxins, altering habitat, displacing indigenous species, or depleting oxygen in the water. The U.S national plan for algal toxins notes that recent years have been characterized by a dramatic increase in the number of HABs and the economic losses resulting from them.[8] This increase can be linked, in part, to increased nutrient loading.[9] Nitrogen loading resulting from fertilizer use is of particular concern.

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[1] This paper was presented during the Sea Grant Law and Policy Journal's inaugural symposium on Coastal Resiliency held on March 25–26, 2008 at the University of Mississippi in Oxford, Mississippi. Coastal resiliency refers to the ability of coastal cities, towns, and communities to adapt to and recover from natural hazards, including hurricanes, tsunamis, floods, and disease epidemics. Seven authors were selected to present papers on a wide range of topics related to coastal resiliency. Powerpoint presentations and additional information about the symposium are available at http://www.olemiss.edu/orgs/SGLC/National/SGLPJ/SGLPJ.htm .

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[5] INTERNATIONAL PANEL ON CLIMATE CHANGE (IPCC), CLIMATE CHANGE 2007 – IMPACTS, ADAPTATION, AND VULNERABILITY (2007).

[6] IPCC, CLIMATE CHANGE 2001 – IMPACTS, ADAPTATION, AND VULNERABILITY (2001).

[7] J.S. RAMSDELL, D.M. ANDERSON, AND P.M. GILBERT (EDS), ECOLOGICAL SOCIETY OF AMERICA, HARMFUL ALGAL RESEARCH AND RESPONSE: A NATIONAL ENVIRONMENTAL SCIENCE STRATEGY (HARRNESS) (2005).

[8] Anderson, D.M, *et al.*, *Harmful Algal Blooms and Eutrophication: Nutrient Sources, Composition, and Consequences*, ESTUARIES 25:704-26 (2002); HARNNESS *supra* note 7.

[9] *Id.*

Both the 2004 Report of the U.S. Commission on Oceans Policy[10] and the 2003 Pew Oceans Commission[11] have identified nitrogen loading, coastal eutrophication, and the proliferation of HABs as major threats to our nation's coastal ecosystem health:

> More than 60 percent of our coastal rivers and bays are moderately to severely degraded by nutrient runoff. This runoff creates harmful algal blooms and leads to the degradation or loss of seagrass and kelp beds as well as coral reefs that are important spawning and nursery grounds for fish. Each summer, nutrient pollution creates a dead zone the size of Massachusetts in the Gulf of Mexico. These types of problems occur in almost every coastal state and the trends are not favorable. If current practices continue, nitrogen inputs to U.S. coastal waters in 2030 may be as much as 30 percent higher than at present and more than twice what they were in 1960.[12]

With respect to nitrogen loading, global increases in total nitrogen fertilizer have been well documented.[13] Glibert, *et al*., also note the importance of changes in fertilizer composition, suggesting that a shift toward urea-based products has led to more than a 100-fold increase in the worldwide use of urea during the past four decades. The authors suggest that higher nitrogen loads and urea concentrations have stimulated the growth of some types of phytoplankton including the increased prevalence of species that are deleterious to the environment, like HABs.[14]

Concerns about nutrient loads, coastal eutrophication, and HABs are central to Florida's water quality regulations. A comprehensive effort is currently underway to bring Florida into compliance with federal water quality provisions. In 1998, several Florida environmental groups filed a lawsuit against the U.S. Environmental Protection Agency (EPA) for its failure to enforce the Total Maximum Daily Load (TMDL) provisions in the Clean Water Act. TMDLs are the amount of each pollutant a water body can receive without violating water quality standards. As a result of the lawsuit, a Consent Decree was issued in 1999 that required the EPA and the Florida Department of Environmental Protection (FDEP) to expedite its assessment of Florida waterways and establish TMDLs in those that are impaired. Florida responded to the Consent Decree by passing the 1999 Watershed Protection Act requiring the FDEP to establish a priority ranking and schedule for analyzing impaired waters along with a methodology for determining those water bodies that are impaired.[15] Nitrates and dissolved oxygen are two measures of water quality that have been problematic in Florida to date.[16] Fertilizer usage can affect both.

A number of Florida state agencies exercise regulatory authority over activities that affect Florida water quality, including FDEP, the Florida Department of Health (FDOH) and the Florida Department of Agriculture and Consumer Services (FDACS), with the FDACS taking the lead with respect to statewide fertilizer use policies. But while these state agencies and the federal government continue to sort through

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[10] U.S. COMMISSION ON OCEANS POLICY, AN OCEAN BLUEPRINT FOR THE 21ST CENTURY: FINAL REPORT OF THE U.S. COMMISSION ON OCEAN POLICY (2004).

[11] PEW OCEANS COMMISSION, AMERICAN'S LIVING OCEANS: CHARTING A COURSE FOR SEA CHANGE: A REPORT TO THE NATION (2003).

[12] *Id.* at vi.

[13] Galloway, J.N., and E.B. Cowling, *Nitrogen and the World*, AMBIO 31:64-71 (2002); Galloway, J.N., *et. al*., *The Nitrogen Cascade*, BIOSCIENCE 53(4):341-56 (2003).

[14] Glibert, P.M., *et al*., *Escalating Worldwide Use of Urea – a Global Change Contributing to Coastal Eutrophication*, BIOGEOCHEMISTRY 77:441-63 (2006).

[15] COMMITTEE ON NATURAL RESOURCES, FLORIDA SENATE, REVIEW OF THE PROGRESS IN IMPLEMENTING THE TOTAL MAXIMUM DAILY LOAD (WATER QUALITY IMPROVEMENT) PROGRAM BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION, Interim Progress Report 2003-136 (2003).

[16] FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP), FLORIDA'S TOTAL MAXIMUM DAILY LOAD PROGRAM: THE FIRST 5 YEARS, A REPORT TO THE LEGISLATURE AND THE GOVERNOR (Feb. 2005); FDEP, INTEGRATED WATER QUALITY ASSESSMENT FOR FLORIDA: 2006 305(B) REPORT AND 303(D) LIST UPDATE (2006).

their respective governance and oversight responsibilities, it is local communities that most often bear the brunt of HABs and other negative environmental impacts attributable to coastal eutrophication. As a result, local governments in Florida have recently become active in taking preventive measures, sometimes going beyond what is required by state and federal laws. In particular, a number of Florida municipal governments have adopted or are considering adopting ordinances that regulate the use of fertilizer by homeowners within their respective districts.

The remainder of this paper will focus on these fertilizer ordinances. Part II begins with a matrix that provides a comparative overview of all salient fertilizer ordinances enacted in Florida since 2003. A concise chronology of the evolution of these ordinances follows. The variation among the substantive components of these ordinances is examined, as well as the implications of developing trends. The crucial role that homeowner associations and related neighborhood and community organizations will have on the ultimate impact of fertilizer ordinances enacted by municipal governments is also explored.

II. Local Fertilizer Ordinances

A. Overview

A chronological matrix was populated with key components of fertilizer regulations adopted between 2002 and May 2008 to compare the different approaches taken by jurisdictions and organizations and to provide a historical context to the evolution of regulations. Regulatory issues generally fell into five categories: education, application standards, site planning, exemptions, and enforcement. This section concludes with a discussion of the problems with regulatory schemes being adopted at different levels of governance and the applicability of these fertilizer regulations to private property owners.

Jurisdiction/ Organization	Florida Green Industries Manual (FGIM)	St. Johns County (Guana Basin)	FDEP, et al. Model Ordinance	City of Naples	SWFRPC	City of Sanibel
Adoption Date:	June 2002	May 2003	September 2003	June 2006	March 2007	Mar. / Sept. 2007
Ordinance No.	Guidelines	2003-52	Guidelines	Res 06-11245	Resolution	07-003 / 07-012
EDUCATION/TRAINING	Occupational Licensing - Training	Occupational Licensing	Occupational Licensing - Training	Occupational Licensing for City Providers	Occupational Licensing - Training	LDRs & Occ. Licensing
SITE PLANNING	Landscape planning - Yes; Site planning - No	Landscape planning - Yes; Site planning - No	Site planning standards applied to new development and redevelopment	No	No	No
ENFORCEMENT	Not addressed	Occupational Licensing	Code enforcement: fine &/or imprisonmen	Occupational Licensing for city providers	Occupational Licensing	Code enforcemen
Mandatory/Voluntary for private homeowners	Recommendation that standards be mandatory for homeowner	Mandatory for homeowner	Recommendation that standards be mandatory for homeowners	No, voluntary	Yes - Mandatory for BMPs, not certification	Yes - Mandatory for BMPs, not certification
APPLICATION						
Blackout period for applying Nitrogen and Phosphorous fertilize	July 1 - Sept. 30 only when heavy rain is imminen	May 15 - Oct. 15	July 1 - Sept. 30 only when heavy rain is imminen	No prohibited period	July 1 - Sept. 30	July 1 - Sept. 30
Maximum P for turf or landscape	0-2%	NA	0-2%	NA	2%	2%
Maximum N per 1,000 Sq ft per application	0.5 lb. / 1,000 s/f if <50% is slow release; 1.0 lb./1000 sf if >50% is slow release	0.5 lb. / 1,000 s/f if <50% is slow release	0.5 lb. / 1,000 s/f if <50% is slow release; 1.0 lb./1000 sf if >50% is slow release	NA	1 pound	1 pound
Maximum N per 1,000 Sq ft per yea	Maintenance level (yr.): Basic 0-2 lbs Moderate: 2-4 lbs High: 4-6 lbs	STA: 4 lbs. / 1,000 s/f annual; BER: 1 appl / crit period w/ 50% slow release; Others: slow release	Maintenance level (yr.): Basic 0-2 lbs Moderate: 2-4 lbs High: 4-6 lbs	NA	4 pounds	4 pounds
Maximum total N for turf or landscape	0.5 lb. / 1,000 s/f if <50% is slow release; 1.0 lb./1000 sf if >50% is slow release	STA: 4 lbs / 1,000 s/f annual; BER: 1 appl / crit period w/ 50% slow release; Others: slow release	0.5 lb. / 1,000 s/f if <50% is slow release; 1.0 lb./1000 sf if >50% is slow release	NA	20%	20%
Total # fertilizer applications per year	NA	every 20 days	NA	NA	6	6
Of N, required slow release N	0.5 lb. / 1,000 s/f if <50% is slow release; 1.0 lb./1000 sf if >50% is slow release	50%	0.5 lb. / 1,000 s/f if <50% is slow release; 1.0 lb./1000 sf if >50% is slow release	NA	70%	70%
Keeping fertilizer off impervious surfaces	Yes	Yes	Yes	NA	Yes	Yes
Use of deflectors shields required	Yes	Yes	Yes	NA	Yes	Yes
No fertilizer zone - waterbody/wetland buffer	10 ft without deflector, 3 ft with deflector	10 ft without deflector, 3 ft with deflector	10 ft without deflector, 3 ft with deflector	NA	25 feet	25 feet
Low/No maintenance adjacent to waterbody or wetland	None	None	6 ft. except when adjacent to seawalls, bulkheads, or for erosion prevention	NA	None	None
EXEMPTIONS						
Turf and landscape establishment period	N/A	N/A	N/A	NA	60 days Conditional - If >25 ft from waterbody	60 days
Vegetable gardens	N/A	N/A	N/A	NA	Yes	Yes
Mulch and compos	N/A	N/A	N/A	NA	Yes	Yes
Golf Courses	N/A	N/A	N/A	NA	Yes	Yes
Agriculture	N/A	N/A	N/A	NA	Yes	N/A
Reuse water buffer to waterbody and wetlands	N/A	N/A	N/A	NA	25 feet	None

Jurisdiction/ Organization	City of Sarasota	Charlotte County	City of North Port	FDACS Florida Consumer Task Force	Lee County	Marion County	City of Jacksonville
Adoption Date:	October 2007	March 2008	December 2007	January 2008	May 2008	Draft	Draft
Ordinance No.	Ordinance 07-4768	2008-28	07-45	Model Ordinance	08-08	Proposed 8.2.10(m-n) Referenced FGIM	Proposed
EDUCATION/TRAINING	Adopted into Code, not LDRs	LDRs & Occ. Licensing	Code & Occ. Licensing	LDRs	Landscape Regulation; not part of LDR	LDRs & Occ. Licensing	NA: Countywide as part of River Accord
SITE PLANNING	No	Zoning code; allows for variances by administrative relief	No	No	Landscape code	LDRs: Landscape code	NA
ENFORCEMENT	Code enforcemen	Occupational Licensing and Monetary Penalties	Code Enforcemen	No	Occupational Licensing and Monetary Penalties	Code Enforcement	NA
Mandatory/Voluntary for private homeowners	Yes - Mandatory for BMPs, not certification	Yes: Non-commercial Applicator	Yes	Follow IFAS recommendation	IFAS guidelines strongly recommended	Yes - All development	Yes
APPLICATION							
Blackout period for applying Nitrogen and Phosphorous fertilize	June 1 - Sept. 30	June 1 - Sept. 30	June 1 - Sept. 30	Flood Watch/Warning; Trop. Storm Watch/Warning; 3-day Cone of Uncertainty; or if heavy rain is expected	June 1 - Sept. 30	No	June 15 - Sept. 15; allows >30% slow release
Maximum P for turf or landscape	<0.25 lbs P/1000 sf per application, <0.50 lbs P/1000 sf per year	<0.25 lbs P/1000 sf per application, <0.50 lbs P/1000 sf per year	0.25/1000 sf app; 0.50/1000 sf yr	2% (FGIM)	<0.25 lbs P/1000 sf per application; <0.50 lbs P/1000 sf per year	Not specified	Pending FDACS/FDEP statewide standard
Maximum N per 1,000 Sq ft per application	Not specified	None	NA	1 lb/1000 sf	NA	0.5 lb. / 1,000 s/f if <50% is slow release; 1.0 lb./1000 sf if >50% is slow release	0.5 lb. / 1,000 s/f if <50% is slow release; 1.0 lb./1000 sf if >50% is slow release
Maximum N per 1,000 Sq ft per year	4 pounds	Bahia: 2-4 lbs. Bermuda: 5-7 lbs. Centipede: 2-3 lbs. St. Augustine: 4-6 lbs. Zoysia: 4-6 lbs.	4 lbs	Bahia: 2-4 lbs. Bermuda: 5-7 lbs. Centipede: 2-3 lbs. St. Augustine: 4-6 lbs. Zoysia: 4-6 lbs.	4 lbs./1000 sf.	Bahia, Centi., St. Aug.: 2 lbs. Berm., Zoy.: 3 lbs.	St. Aug.: 4 lbs/1000 sf
Maximum total N for turf or landscape	Not specified	Bahia: 2-4 lbs. Bermuda: 5-7 lbs. Centipede: 2-3 lbs. St. Augustine: 4-6 lbs. Zoysia: 4-6 lbs.	4 lbs	1 lb/1000 sf	4 lbs/1000 sf.	0.5 lb. / 1,000 s/f if <50% is slow release; 1.0 lb./1000 sf if >50% is slow release	0.5 lb. / 1,000 s/f if <50% is slow release; 1.0 lb./1000 sf if >50% is slow release
Total # fertilizer applications per year	NA	NA	NA	NA	NA	Not specified	Max: 20 days
Of N, required slow release N	50%	50%	50%	Rule 5E-1.003(2) FAC provides max amounts based on overall solubility	50%	If .50%, 0.5 lb per 1000 sf	NA
Keeping fertilizer off impervious surfaces	Yes	Yes	Yes	Yes	Yes	NA	NA
Use of deflectors shields required	Yes	Yes for broadcast spreaders along water & impervious surfaces	Yes	Yes for rotary spreaders; No for others; 3 ft. with shield	Yes	No	NA
No fertilizer zone - waterbody/wetland buffer	10 feet	10 feet	10 ft	10 ft	10 ft without deflector, 3 ft with deflector	10 feet	NA
Low/No maintenace adjacent to waterbody or wetland	Voluntary Low Maintenance Zon	NA	6 ft voluntary	No; 6 ft. zone strongly recommende	Recommended: 6 ft	NA	NA
EXEMPTIONS							
Turf and landscape establishment period	60 days	certified applicator to apply one application of (N) fertilizer & 0% (P) during Restricted Season but not in 24 hrs. of known rain event	60 days	Yes; one time use 1.0 lb/1000 sf	60 days	30 days new turf; 60 days damaged turf	N/A: FGIM standards
Vegetable garden	No	No	No	No	Conditional - If >15 feet from waterbody	No	N/A: FGIM standards
Mulch and compos	No	No	No	No	Yes	No	N/A: FGIM standards
Golf Courses	Yes	Yes	Yes	No	Yes	Yes: Intensive recreation areas	IFAS standards
Agriculture	Yes	Yes	Yes	Yes	Yes	Yes	N/A: FGIM standards
Reuse water buffer to waterbody and wetlands	None	No	NA		Yes	1/2 amount allowed if not reuse	N/A: FGIM standards

B. Chronology

Our analysis starts with the Florida Green Industries Manual (FGIM), published in 2002.[17] The 66-page FGIM provided Best Management Practices (BMPs) for turfgrass and landscape maintenance to be used by professional landscapers statewide. The goal was to conserve and protect Florida's water resources. The FGIM authors acknowledged using the Professional Lawn Care Association of America's BMPs for Turfgrass document as a guide.

Prior to FGIM, two local governments, St. John County and the Village of Wellington, had promulgated fertilizer restrictions. Both of these actions targeted improved water quality for a deficient hydrological system. The Wellington provisions[18] were aimed at decreasing phosphorous runoff from ranching operations into the Everglades Restoration Area. These provisions were considered too narrowly defined and for a purpose uncommon to coastal communities – livestock ranching – to provide adequate information for this article. The County of St. John's ordinance[19] was tailored to improve the quality of the Guana River basin. Successfully challenged upon adoption in 2001, the provisions were later amended in 2003. The amended regulations incorporated many of the BMPs that were recommended in the FGIM. These revised regulations are summarized in the matrix.

The FDEP provided the first statutory guide in September 2003 with its publication of a model ordinance.[20] The provisions of the 2003 guidelines combined and incorporated "Florida-friendly" landscape concepts provided by the University of Florida Cooperative Extension Services' *Florida Yards and Neighborhoods*[21] and *Environmental Landscape Management*[22] programs and best management practices (BMPs) from the *Florida Green Industries Best Management Practices for Protection of Water Resources in Florida*.[23] The FDEP model ordinance could have provided a valuable statement of the state of fertilizer regulation at the time, but the agency largely limited its guidance to site planning techniques, only briefly addressing fertilizer regulation and incorporating the FGIM standards by reference.

Aside from a 2006 resolution adopted by the City of Naples, no new fertilizer ordinances were adopted until 2007.[24] 2007 brought a flurry of activity, however, with numerous jurisdictions in southwest Florida considering and adopting fertilizer use ordinances. The primary impetus for this wave of ordinances was the Southwest Florida Regional Planning Council's (SWFRPC) adoption of a resolution that provided a model ordinance for fertilizer use regulation that was approved by all 22-member jurisdictions on March 15, 2007.[25] The model ordinance was more stringent than the BMPs and adopted ordinances that came before it and served as the model for Sarasota County's ordinance. By the end of 2007, five of the SWFRPC's member jurisdictions enacted new fertilizer regulations: the City of Sanibel Island, Sarasota County, the City of Sarasota, the City of Cape Coral, and the City of North Port.[26] Charlotte County, Lee

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[17] FDEP, FLORIDA GREEN INDUSTRIES MANUAL: FLORIDA GREEN INDUSTRIES BEST MANAGEMENT PRACTICES FOR PROTECTION OF WATER RESOURCES IN FLORIDA (June 2002).
[18] Village of Wellington, Fla., Municipal Code § 30-155.
[19] St. Johns County, Fla., Ordinance 2003-52 (May 27, 2003).
[20] FDEP, GUIDELINES FOR MODEL ORDINANCE LANGUAGE FOR PROTECTION OF WATER QUALITY AND QUANTITY USING FLORIDA FRIENDLY LAWNS AND LANDSCAPES (Sept. 2003).
[21] Florida Cooperative Extension Service, Florida Yards and Neighborhoods, http://fyn.ifas.ufl.edu/ .
[22] Hendry County (FL) Cooperative Extension Office, Environmental Landscape Management, http://hchort.ifas.ufl.edu/EnviroLandscape.htm .
[23] FGIM, *supra* note 16.
[24] Naples, Fla., Resolution No. 06-11245 (June 7, 2006).
[25] Southwest Fla. Regional Planning Council, Resolution No. 07-01 (March 15, 2007).
[26] Sanibel, Fla., Ord. No. 07-003 (March 6, 2007) and Sanibel, Fla., Ord. No. 07-012 (Sept. 18, 2007); Sarasota County, Fla., Ord. No. 2007-062 (Aug. 27, 2007); Cape Coral, Fla., Ord. No. 72-07 (October 29, 2007); Sarasota, Fla., Ord. No. 07-4768 (Oct. 15, 2007); North Port, Fla., Ord. No. 2007-45 (Nov. 26, 2007).

County, and the Town of Longboat Key adopted fertilizer use ordinances in the spring of 2008.[27] Three additional jurisdictions in southwest Florida were also considering fertilizer regulations at this time.[28] Many of these communities suffered from an especially severe Florida red tide bloom in 2005 and additional algal blooms in 2006.[29]

Coastal communities in Charlotte and Lee Counties have experienced other HABs that have been linked to water releases from Lake Okeechobee and other forms of nutrient loading in the Peace River and Charlotte Harbor Watersheds. The Caloosahatchee River carries the nutrient-rich lake water into Charlotte Harbor, which then disperses along the Lee County coastline. Above-normal rainy seasons in 2004 and 2005 resulted in record level storage in Lake Okeechobee, leading to large releases of lake water into the river. As the releases traveled downstream, they combined with additional polluted runoff from non-point sources within the river basin. Some scientists have argued that this combination generated significant algal blooms along the coastline. Although not as physically debilitating as red tide, these other algal blooms had significant impacts on coastal habitat and wildlife. [30]

Despite what appears to be increasing scientific data and public concern regarding fertilizer use and coastal resiliency, the momentum for increasingly stringent fertilizer ordinances seems to have stalled in the wake of an ordinance adopted by Sarasota County in August 2007, at least until Lee County recently adopted its ordinance. As will be discussed below, Sarasota County's ordinance went beyond its predecessors, primarily with respect to some of its substantive measures and mandatory nature. Since then some communities have witnessed a backlash from homeowners expressing property rights concerns. Many have expressed a preference for voluntary as opposed to mandatory measures and educational strategies as opposed to regulations requiring enforcement of sanctions.

Also important has been the fact that the fertilizer industry and other affected interest groups have sought to preempt the escalation of restrictions by harmonizing fertilizer regulations in the form of a new model ordinance for municipalities. A Florida Consumer Fertilizer Task Force established under the auspices of the FDACS released its final report in January 2008.[31] The recommended provisions of the report and the associated model ordinance supported the standards promulgated by the FGIM. A proposed bill based upon this report failed to pass during the 2008 legislative session.

Finally, it seems likely that the heightened concerns about the ecological impacts of fertilizer use in the wake of severe HABs may have waned slightly in the presence of a drought that seems to have temporarily diminished HAB outbreaks in the southwest Florida region.[32] Even in light of the recent occurrence of a persistent severe HAB that demonstrated the need to control and reduce nutrient runoff, Collier County recently withdrew their proposed fertilizer regulation ordinance from consideration.

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[27] Charlotte County, Fla., Ord. No. 2008-28 (March 2008); Lee County, Fla., Ord. No. 08-08 (May 14, 2008); Town of Longboat Key, Fla., Ord. No. 2008-04 (May 5, 2008). The Town of Longboat Key ordinance was not part of this paper's analysis.

[28] City of Punta Gorda, Fla., City of Bonita Springs, Fla., Town of Ft. Myers Beach, Fla., per SWRPC 2007.

[29] National Oceanic and Atmospheric Administration (NOAA), Gulf of Mexico Harmful Algal Bloom Bulletin (Oct. 30, 2006) *available at* http://coastwatch.noaa.gov/data/hab_bulletins/HAB20061030_200674_SFL.

[30] LAPOINTE, B.E., AND B.J. BEDFORD, DRIFT RHODOPHYTE BLOOMS EMERGE IN LEE COUNTY, FL: EVIDENCE OF ESCALATING COASTAL EUTROPHICATION: FINAL REPORT TO LEE COUNTY AND THE CITY OF BONITA SPRINGS (Mar. 2006); LAPOINTE, B.E., *ET. AL*., HARMFUL ALGAL BLOOMS IN COASTAL WATERS OF LEE COUNTY, FL: BLOOM DYNAMICS AND IDENTIFICATION OF LAND-BASED NUTRIENT SOURCES: PHASE II FINAL REPORT (TO LEE COUNTY) (June 2006).

[31] FLORIDA DEPT. OF AGRICULTURE AND CONSUMER SERVICES (FDACS), FLORIDA CONSUMER FERTILIZER TASK FORCE FINAL REPORT (Jan. 15 2008).

[32] The North and Central East Coast of Florida was affected by a persistent red tide bloom during 2007, however.

C. Ordinance Components

The persistent HABs of the past few years lead local jurisdictions to seek ways they could protect local waters and diminish the impacts of HABs. As noted above, nutrient runoff from fertilizer had been linked to the proliferation of HABs and methods to decrease runoff had been established in BMPs and model ordinances. Standards for education of applicators, periods of non-application, intensity of fertilizer treatments, and regulation of use based on the location of water resources and drainage underpinned the effectiveness of the regulations. The unanswered questions for municipalities were the severity of the use restrictions and the scope of enforcement actions.

As several jurisdictions in close proximity sought to regulate fertilizer use over the past twelve months, proposed and adopted regulations often relied on ordinances already proposed by another jurisdiction. Sanibel Island adopted regulations similar to SWRPC's model. The City of Sarasota regulations explicitly mirrored Sarasota County. The City of Jacksonville delayed adoption pending the release of the model ordinance promulgated by FDACS' Consumer Fertilizer Task Force. However, the ordinances reviewed contained many similar key components including standards for fertilizer application, education and training, site planning, and exemptions for specific uses.

Twelve jurisdictions required education or training as part of their occupational licensing process to ensure that commercial applicators knew the new fertilizer use regulations or BMPs. A licensee must show that a staff person within its commercial enterprise completed the requisite number of credit hours or coursework on BMPs and the local regulations to receive an occupational license. This requirement was mandatory in all local jurisdictions, except the City of Cape Coral ordinance, which recommended education. FGIM, and the FDEP 2003 and the FDACS 2008 model ordinances recommended mandatory licensing based on continuing education.

Regulations almost unanimously provided for prohibited application or "blackout" periods, restrictions of the levels of phosphorous and nitrogen in the fertilizer, and the relative mix of slow release nitrogen in fertilizer. Blackout periods were enacted to prevent the spread of fertilizer washed from saturated soil into open waters during the rainiest months of the year, which coincided with the summer months in Florida. FGIM identified July 1 through September 30 as the window of likely high rainfall amounts. However, the manual suggested prohibiting fertilizer application only for an imminent threat of heavy rain. FGIM's recommendations mirrored those contained in the Institute of Food and Agricultural Sciences' (IFAS) *General Recommendations for Fertilization of Turfgrasses in Florida* published in 1991.[33] Although revised in May 2007, its original recommendations continued to be incorporated into manuals and ordinances seventeen years later. FDEP repeated these recommendations in its model ordinance.

FDACS' model ordinance followed a unique path, recommending non-application periods based on definable weather events, including flood and tropical storm watches and warnings, a three-day "cone of uncertainty," or in the expectation of heavy rain. The method by which to enforce non-application periods based on weather-driven benchmarks was not provided.

All local regulations maintained either a June 1 or July 1 start date for the blackout period and an end date of September 30/October 1, except the City of Jacksonville, which proposed a variation that allowed the application of fertilizers containing at least 70% slow release nitrogen between June 15 and September

[33] UNIVERSITY OF FLORIDA INSTITUTE OF FOOD AND AGRICULTURAL SCIENCES (IFAS), GENERAL RECOMMENDATIONS FOR FERTILIZATION OF TURFGRASSES IN FLORIDA, Document SL-21 (2007) *available at* http://edis.ifas.ufl.edu/LH014 .

15. Local weather differences between the northeast corner of the state and the southwest coast may explain the variations.

In addition to blackout periods, intensity of fertilizer application formed the other overarching restriction among the jurisdictions. The intensity of fertilizer use enjoins three concepts: time, area, and strength of dosage. These concepts combined to form eight types of regulations as shown in the matrix: maximum phosphorous strength, maximum nitrogen per application, maximum applications of nitrogen per year, maximum nitrogen levels allowed per area per year, maximum nitrogen levels applied per year, maximum total nitrogen, restriction of total number of applications per year, and the required use and percentage of slow-release nitrogen. Many of the nitrogen restrictions overlapped.

FGIM recommended a phosphorous component of no more than 2%. This standard was followed by FDEP, SWRPC, and Sanibel Island. Neither St. Johns County nor the City of Naples regulated the use of phosphorous. Starting with Sarasota County in August 2007, all of the southwest Florida jurisdictions except the City of Cape Coral adopted a maximum phosphorous application standard of 0.25 pounds per 1,000 square feet per application and 0.50 pounds per 1,000 square feet per year. FDACS' standards and the proposed standards of Marion County and the City of Jacksonville returned to the 2% standard originally stated in the FGIM BMPs.

FGIM recommended that 0.50 pounds of nitrogen per 1,000 square feet per application as the standard for the maximum nitrogen used, unless a minimum of 50% of the nitrogen content was slow release nitrogen. If the 50% standard was met, then the recommended amount was one pound per 1,000 square feet per application. These standards remained consistent throughout the local regulations; however, the regulation was written in two different ways dependent on whether the ordinance required a minimum of 50% slow release nitrogen in all fertilizer. If a slow release minimum was required, then the standard required was one pound of nitrogen per 1,000 square feet per application. Those guidelines and ordinances that did not require a slow release minimum, allowed for the application of one-half pound of any type of nitrogen per 1,000 square feet and up to one pound if at least 50% was slow release. The City of North Port was the lone exception, stating that the application amount of fertilizer should be the "lowest rate necessary" per application.[34] The term "necessary" was not defined.

Six jurisdictions limited nitrogen application amounts to four pounds per year for every 1,000 square feet per year. Charlotte, Lee, and Marion County, and the City of Jacksonville specified limits based on the type of turf. The FGIM manual recommended standards based on the level of maintenance necessary to achieve the desired result. Basic, moderate, and high maintenance levels set limits of zero to two pounds, two to four pounds, and four to six pounds of nitrogen per 1,000 square feet per year, respectively. The 2003 FDEP model ordinance adopted this language by reference.

The regulation of a total amount of nitrogen content applied to turf was specifically regulated by eleven of the fifteen documents reviewed. SWRPC and Sanibel Island distinguished the total nitrogen allowed per use from the maximum annual amount. These jurisdictions limited the total amount of nitrogen to 20% of the fertilizer.

Only SWRPC and Sanibel Island regulated the total number of fertilizer applications per year, allowing no more than six applications per year. St. Johns County and the City of Jacksonville restricted fertilizer applications to no more than every twenty days, the only jurisdictions to regulate the timing of applications.

[34] North Port, *supra* note 23, § 8.03.

FGIM guidelines recommended applying fertilizer that contained at least 50% slow release nitrogen. However, the FGIM model ordinance recommended requiring slow release nitrogen fertilizer only in environmentally sensitive areas. Of the six other jurisdictions that required specific percentages of slow release fertilizer, five adopted the 50% rule. Only SWRPC recommended a different percentage (70%), while five of the seven signators of that regional guideline enacted a 50% standard (Sanibel Island, Sarasota County, City of Sarasota, Charlotte County, North Port).

Both FGIM and FDEP model ordinances recommended the application of the IFAS SL-21 standards[35] for fertilizer containing a minimum of 50% slow release nitrogen. The FDAS model ordinance relied on FGIM's recommendations. Marion County's proposed ordinance tied the amount of slow release nitrogen to the overall amount of fertilizer allowed for every 1,000 square feet. If more than 50% of the fertilizer was slow release, then the applicator may use one pound of fertilizer per 1,000 square feet. If the amount of slow release nitrogen was less than 50%, then the applicator may spread no more than one-half pound of fertilizer per 1,000 square feet. Regulation of the amount of nitrogen per application, the maximum nitrogen applied per year, the maximum total nitrogen content allowed, and the amount of slow release nitrogen content may overlap in some cases, possibly creating confusion for commercial and private applicators.

Local governments traditionally use site planning techniques to regulate the location of structures, at-grade improvements, and plants and landscaping in relation to structures, neighboring properties, infrastructure, and natural resources.[36] Local land development regulations (LDR) typically contain these techniques and landscaping requirements. Site planning as a means to control nutrient runoff was virtually ignored by the FDACS model ordinance and all local ordinances. A line item in the matrix highlights whether the adopted regulations affected land development regulations. If the fertilizer regulations are not included in the local government's LDR, the regulations will probably not become part of an overall scheme to address fertilizer impacts, the method suggested by the FDEP guidelines. This omission would tend to lessen the effectiveness of adopted regulations to improve water quality. Although not part of a comprehensive site planning process, local jurisdictions did adopt a few inter-related site planning techniques, such as buffer zones, bans near impervious surfaces, and the use of deflector shields.

Buffer zones minimize runoff into bodies of water and wetlands.[37] Two adopted methods of buffering addressed two separate problems. The first method prohibited the application of fertilizer within a specific distance of a water body. Thirteen of the fifteen ordinance supported buffer zones. Five jurisdictions adopted and FDACS recommended a ten-foot buffer. SWRPC and Sanibel Island adopted a 25-foot buffer zone, the largest area, and Cape Coral enacted a 15-foot zone. FGIM, FDEP, St. Johns County, and Lee County proposed 10-foot no fertilizer zones if a deflector shield was not used, reduced to three feet with the use of a deflector shield. No other regulations provided for a reduction in the zone based on the use of deflector shields. The goal of avoiding direct discharges of fertilizer into a water body also pertained to the second type of buffer, no maintenance or low maintenance zones.

The purpose of a no/low maintenance zone is to trap nutrients in a vegetative buffer before discharging into a water body or drainage.[38] No jurisdiction mandated the establishment of these no/low maintenance zones and only Sarasota County and the Cities of Sarasota and North Port referenced this type of zone. The City of North Port recommended a distance of six feet. The FDEP model ordinance provided for 6-

[35] *See* note 33, *supra*.
[36] FDEP 2003, *supra* note 19.
[37] LEE COUNTY (FL) DIVISION OF NATURAL RESOURCES, SCIENTIFIC LITERATURE REVIEW, DISCUSSION, PUBLIC COMMENTS, AND CONSIDERATIONS FOR THE PROPOSED LEE COUNTY LANDSCAPE AND FERTILIZER BEST MANAGEMENT PRACTICES ORDINANCE (Oct. 2007).
[38] *Id.* at 11.

foot no-maintenance zones, except when adjacent to seawalls or bulkheads, or for erosion prevention. FDACS' model ordinance "strongly" recommended a 6-foot no/low maintenance zone. This is the one analyzed criteria where the FDACS model ordinance appeared to be more prohibitive than the majority of local jurisdictions.

The prohibition of fertilizer runoff from impervious surfaces was another method to keep nutrients out of water bodies. Eight jurisdictional ordinances and the SWRPC prohibited the intentional or unintentional release of fertilizer onto impervious surfaces. The subject was not addressed by four local ordinances (Naples, Cape Coral, Marion, and Jacksonville). All three state guidelines recommended this prohibition. As in buffer zones, deflector shields help direct fertilizer distribution away from impervious surfaces.

The FGIM manual recommended deflector shields. The FDACS model ordinance recommended their use only for rotary spreaders. Eight of the remaining fourteen ordinances required the use of deflector shields. Variations on the initial blanket requirements for the use of shields were the inclusion of types of spreaders, and required distances from water bodies and impervious surfaces.

The type of spreader regulated may confuse applicators. FGIM recommended shields without specifying a type of spreader. Charlotte County required deflector shields on "broadcast spreaders" and FDACS recommended regulation of "rotary spreaders." Whether the difference in terms proves inconsequential to applicators working in multiple jurisdictions remains to be determined.

Most ordinances and guidelines exempted certain fertilizer uses from regulation, typically for new or damaged turf and landscaping, vegetable gardens, mulch and composting, golf courses, and agricultural or ranch lands. Nine local jurisdictions allowed for the application of fertilizer to establish turf on new lawns and landscaping. FDACS uniquely recommended a booster shot, a one-time exemption for the application of one pound of fertilizer per 1,000 square feet. However, FGIM's and FDEP's statewide guidelines, and local regulationns for vegetable gardens (SWRPC, City of Sanibel, and Lee County). SWRPC and Lee County exempted garden areas more than twenty-five feet from a water body. These three jurisdictions also exempted mulch and compost from regulation. The use of the term "exemption" mischaracterized the regulatory nature of fertilizer use for golf courses and agricultural lands. Although eight of the ordinances provided exemptios that incorporated their standards by reference, such as the City of Jacksonville, St. Johns County, and the Cities of Cape Coral and Naples, did not address the subject. Three ordinances granted exemptions for golf courses, these provisions deferred to statewide standards that regulated golf courses.[39] The same state regulation preemption policy held true for agricultural and livestock grazing exemptions.

Various factors determine the enforceability of fertilizer regulations. Adopted ordinances became codified in most jurisdictions' codes of ordinances, whether in the Land Development Code or in a separate section. In Naples, however, the guidelines passed as a resolution in support of a series of recommendations and, therefore, are not binding or enforceable. The code enforcement departments have responsibility for enforcing the local governments codes. Code enforcement provisions typically provide for fines and/or imprisonment. Code enforcement is often instigated by resident phone calls ("tips") to the departments. However, reliance on residential inquisitiveness to support enforcement of regulated amounts applied, amounts applied over extended time periods, and specific slow-release percentages, may prove difficult.

Enforcement tools for the local ordinances emanated from the ability of the local jurisdiction to license fertilizer applicators to contractually provide commercial services within the jurisdiction. Occupational licenses must be renewed annually providing a means to continually enforce the education and training

[39] FDEP, BMPS FOR THE ENHANCEMENT OF ENVIRONMENTAL QUALITY ON FLORIDA GULF COURSES (Jan. 2007)

components of the code. No jurisdiction required that all applicators be trained, only that a licensed applicator be on-site to supervise other employees.

Commercial applicators working in more than one jurisdiction may encounter difficulties tracking applications and complying with different rules within different jurisdictions. For instance, seven local jurisdictions regulated the maximum nitrogen per 1,000 square feet, but only the Cities of Sanibel and Jacksonville limited the number of applications allowed per year. Tracking applications and making adjustments based on clients' individually desired level of turf "greenness" should prove challenging to commercial applicators and to government officials seeking to enforce the code. Whether the required education and training translates into proper application in the field remains to be determined.

D. Lessons Learned and Trends Discerned

The promulgation of regulations and recommendations at different levels of governance raises issues of consistency and geographical adequacy. The vertical interplay between federal, state, and local levels of government mixing with the horizontal interchange of terrestrial and marine responsibilities within these governance levels creates a complex matrix of laws and regulations of which fertilizer use is but a single component. For example, although the five state water management districts are charged with issues of water quality, FDEP retains "general supervisory authority" over the districts and, independent of the districts, over the TMDL program. FDACS also has a role in the TMDL program as the assigned developer of BMPs for agriculture and being charged with the development, administration, and enforcement of Florida's Commercial Fertilizer Law.[40]

Local communities bear the brunt of HAB impacts, however, and this has led to the recent wave of fertilizer ordinances. Certain elements of these ordinances, like fertilizer composition requirements, may require harmonization with state and/or federal standards. Other elements, including BMPs, could easily vary in accordance with the needs and/or political preferences of specific municipalities. This would seem consistent with FDEP's approach to watershed management in terms of calibrating standards for individual watersheds and basins.[41]

As shown in the matrix above, the state and some counties and municipalities attempted to maintain current levels or decrease runoff from nutrient-laden fertilizer through the introduction of BMPs. The general process for drafting BMPs brings together a large group of stakeholders that hold public meetings to hear testimony from specialists and the public and incorporate these findings into a document on which a pre-selected majority approved. Inherent in the process is a series of compromises between different interest groups to achieve approval of the final document. Therefore, the standards agreed upon may not be based on the best science available or sufficient to accomplish desired reductions in fertilizer impacts. Most importantly, the BMPs reviewed promulgated voluntary action and avoided the task of recommending enforcement mechanisms.

The FGIM guidelines show the paradox between adopting statewide standards for local implementation and enacting local ordinances tailored to local characteristics. As a statewide guideline, recommendations address circumstances applicable to a large portion of the state. As discussed above, regulations for a geographic scope this large is probably less than optimal for local or regional situations if it does not provide for regional and local variations. Statewide regulation may forfeit the flexibility and adaptability inherent to local regulation.

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[40] FRANK ALCOCK, MOTE POLICY INSTITUTE AT MOTE MARINE LABORATORY, AN ASSESSMENT OF FLORIDA RED TIDE: CAUSES, CONSEQUENCES, AND MANAGEMENT STRATEGIES (Aug. 2007).
[41] *Id.* at 26.

Areas that suffer large HAB and red tide episodes may need more drastic and immediate intervention than non-impacted areas to stave off further economic losses. As the following language demonstrates, FGIM recognized the limitations of the broad application of its provisions:

> This document should be used to enhance the professional knowledge and judgment of turfgrass and landscape managers, and should not be viewed as a regulatory standard to be rigidly applied in all cases. Turfgrass and landscape managers should use the information provided here as general guidance, but specific situations may require more restrictive measures to protect sites that are at particularly high risk for adverse effects on surface water and ground water.[42]

The implementation of mandatory requirements and stronger language represents one of the most significant trends in local ordinances over the past five years. However, the benefits of local customization may be offset by local political concerns, omitting or watering down scientifically accepted standards. The path of least resistance for many local governments could be to adopt the BMPs promulgated by a state agency. In theory, local regulations reflect the best management practices for the jurisdiction while statewide BMPs encompass a statewide scope that provided generally applicable rules. Before the state moves toward mandatory standards, the question of whether state rules will preempt more stringent local regulations needs to be answered.

Another problem with enacting best local practices arose from the manner in which jurisdictions create local regulations. A benefit of not being first in time to adopt an ordinance rests in the ability of the latter jurisdiction to review the performance of other ordinances, and to add or omit attributes based on their functionality while also incorporating newer scientific findings. However, by shadowing previously adopted regulations local governments risk losing the ability to adopt more efficient techniques.

All BMPs and local regulations reviewed ignore important territorial areas affecting water quality: watersheds and water basins. Most major watersheds stretch far beyond a single county line, much less municipal limits. Florida recognized the importance of watershed management more than twenty years ago when the state legislature divided the state into five regional water management districts, under the oversight of FDEP, for the protection of the state's waters. The size of the areas managed by these districts provided the size necessary to encompass whole or large portions of watersheds. The water management districts also possess the regulatory clout to adopt and enforce rules and regulations. Although the management districts participated in the development of statewide standards and published regional guidelines, rules regulating the use of fertilizers throughout a watershed, except for the Everglades, have not been adopted. This omission must be addressed in the future to achieve desired state and local goals, an omission that the forthcoming implementation of TMDL standards may resolve. However, BMPs developed for other multi-jurisdictional circumstances, e.g. watershed and hydrological boundaries that cross local jurisdictional boundaries, may be inconsistent with local regulation. Local ordinances without the participation of all jurisdictions in a watershed might help, but the gains will be negated by the weakest ordinance in the basin.

That a major impetus for local regulation came from the SWRPC suggests that the member jurisdictions found state guidelines inadequate to meet local conditions or, at least, local public perceptions. These jurisdictions, however, recognized the importance of enacting a regulatory scheme of regional scope to protect Florida's waters. Regional Planning Commissions (RPC) typically focus on growth-related regional concerns including concurrency, traffic, housing, and the environment. However, local jurisdictions still must adopt the regulations separately as part of their codes of ordinances because an RPC does not have legislatively delegated powers like the Water Management Districts. Still, only nine of the twenty-two member governments have adopted fertilizer use ordinances.

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[42] FGIM, *supra* note 16.

The progression of the provisions enacted or proposed from 2003 to 2008 show minimal adaptations to fertilizer use regulation since 2002. The generally accepted methods then, remain the methods in 2008. Public education was a common component among all ordinances and guidelines. Local jurisdictions established education programs for the public extolling application guidelines, point-of-sale literature, and training and licensing of commercial applicator personnel, promotion of slow release fertilizer, and the adoption of statewide BMPs.

Most jurisdictions outside of the SWRPC, which enacted the most stringent regulations in the state, adopted the less-restrictive state guidelines proposed by FGIM and the FDEP 2003 model ordinance, although omitting the broad site planning approach put forth by the FEDP. Of the three SWRPC county jurisdictions considering fertilizer regulations more stringent than the State guidelines in May 2007, only Sarasota County enacted new fertilizer regulations that year. Although explicitly waiting for the publication of the FDACS model ordinance, the other two counties, Charlotte[43] and Lee[44], adopted fertilizer use ordinances in March and May 2008, respectively, that were similar to Sarasota County's.

The length of time from the first ordinance proposed to final adoption for Charlotte and Lee Counties coincided with a lack of a significant red tide episode in 2007 and suggested a relationship between the time removed from a significant HAB event and the level of regulation of fertilizer use. Lee County's original ordinance followed the SWRPC model, while the October 2007 draft followed the less restrictive standards of FGIM. The most recent draft offered the County Commission two options, the FDACS model or the Sarasota County model.

Charlotte County decided to postpone adopting an ordinance pending the release of FDACS report. Even though the County waited, its adopted ordinance did not follow the FDACS model. Instead the County enacted more restrictive regulations, including a tiered level of fines up to $500 for the third offense. Considering that Lee and Charlotte Counties were signators of the SWRPC guidelines and should have benefited from the momentum of that agreement, the lag in time from initial direction by elected officials to enactment of an ordinance suggested that the lack of an HAB event might have impacted the level of regulation. However, the ordinances that Charlotte County and Lee County adopted counter the argument that a relationship existed between the time lapsed from an HAB event and the severity of the regulation. Other jurisdictions that postponed reviewing regulations until the release of FDACS Consumer Fertilizer Task Force report should move ordinances forward in the coming months. Whether these jurisdictions will enact rules patterned on FDACS will be determined as the rules are drafted.

The future of regulating homeowners and other private self-applicators is unclear. Residential fertilizer runoff appears to be a significant contributor to nutrient loads in surface water. A 2004 study of nitrogen loading of the Wekiva Springs (a.k.a. Wekiwa Springs) watershed found that 42 percent of all nitrogen inputs into the basin waters came from residential uses.[45] The findings suggest that nutrient runoff into the state's coastal waters from residential sources would increase significantly as a result of the state's rapidly growing population over the last several years. A Lee County study supported this suggestion finding that residential fertilizer sales between 1998 and 2006 increased from 5,238 tons to 20,420 tons or 290 percent.[46] These studies highlight the importance of private homeowners in the introduction of nutrients into coastal waters.

[43] Charlotte County, *supra* note 23.
[44] Lee County, *supra* note 23.
[45] Lee County, *supra* note 35.
[46] *Id.*

The impact of all of the reviewed ordinances on private homeowners appeared minimal. Although twelve of the guidelines and ordinances required that private homeowners follow BMPs, at a minimum, all lacked enforcement provisions. In addition, self-applicators faced the difficulty of understanding the technical provisions of FGIM's 66-page document, also referenced by FDACS, and other BMP manuals designed for professional landscapers.

Public hearings provided valuable insight into the general public's concerns about not being able to fertilize *their* lawns and how private property rights often framed the discussion. These concerns became magnified in the context of a subdivision with a homeowners association where neighborhood aesthetics and property values clashed with private property rights. The impact of these fertilizer regulations on homeowners associations appeared minimal. Whereas multi-family developments generally employ professional landscape companies that must comply with fertilizer use regulations, homeowners often self-fertilize their lawns. Deed restrictions and homeowner association agreements sometimes require that a level of aesthetic desirability be maintained on all parcels in the subdivision. The "greenness" of the lawn may be one requirement. Therefore, homeowner associations might be at odds with sound fertilizer application practices. However, they might also play a valuable role in implementing best practices that would significantly improve the amount of nutrient runoff to the benefit of Florida's coastal waters.

III. The Role of Homeowner's Associations

At first glance it might appear that municipalities occupy the bottom rung of a hierarchy of governance levels that affect fertilizer use. Upon closer inspection, however, it becomes apparent that more localized governance institutions like homeowner associations can have a greater impact on the behavior of residential homeowners than municipalities, states and the federal government. The most salient of these institutions is the homeowner association (HOA); other relevant entities include more informal and community and neighborhood associations as well as community development districts (CDDs). It is estimated that over 2 million Florida residents live under some form of homeowner, neighborhood or community association.[47]

Homeowner's associations (HOAs) are governed by Chapter 720 of the Florida Statutes. This chapter governs the ways in which HOAs can be formed and how they in turn govern their members. Questions have been raised about the ability of municipalities and counties around the state of Florida to enforce the fertilizer ordinances that they have passed. HOAs may prove instrumental in the effort to ensure that ordinances can be effective. In addition, permitting agencies can work with HOAs in ways that would facilitate the realization of the goals articulated in the ordinances.

HOAs collect dues from the homeowners in their subdivisions and utilize that money for improvements and upkeep of the shared areas of the community. HOAs are originally formed by the developer that is constructing the subdivision, and are then turned over to the homeowners three months after the development is 90% complete or until such time as is set out in the Master Declaration and documents.[48] The developer is responsible for writing the initial Master Declaration and documents, and is also responsible for articulating the binding restrictive covenants of the community as well as obtaining permits from the Department of Environmental Protection, the regional Water Management District, and the local municipal or county government. The homeowners on the newly established board of the HOA can vote to vacate certain conditions articulated within the Master Declaration, but restrictive covenants "run with the land" and not the person, and HOAs are also required to follow permits entered into by the developer with governing agencies.

[47] Florida Coalition of Community Associations, http://www.cocafl.org/ .
[48] See F.S.S. 720.307 (1)

Community and/or neighborhood associations are informal groups similar to HOAs but voluntary in nature. These groups identify themselves with a common area of a municipality or an unincorporated area of a county that usually does not have an HOA, although these associations can also exist alongside HOAs. Community associations have the ability to have public meetings, to lobby local governments and politicians, and to take a more informally active role in rallying their communities to embrace voluntary guidelines set out by the various state agencies. Community and neighborhood associations are weaker than HOAs in that they have no legal power to enforce agreements or restrictions on its members.

CDDs are another governance entity that is governed by Chapter 190 of the Florida Statutes. CDDs usually encompass large areas of territory that may include many different communities and HOAs. CDDs have a board of directors, and are responsible for managing all common areas held by the CDD, upkeep of all roads, wetlands, ponds, lakes, and other natural features of the CDD held area. CDDs are responsible for meeting state and federal guidelines regarding fertilizer application, wetlands and discharge permitting, and cultural resource preservation. This places the CDDs in the best position to create and enforce rules relating to discharge, runoff, and the other factors that affect fertilizer use. Homeowners pay a monthly fee to CDDs, in a manner similar to the way in which HOAs operate. The weaknesses of CDDs lie in the fact that they are narrowly construed and regulated by the provisions of Chapter 190 and have to rely on their homeowners and HOAs if there is a desire to educate the community, hold community events, or attempt to rally a community around a cause. There are ambiguous clauses within Chapter 190 that could be read to allow CDDs to hold such events as long as they were on CDD-held property, but the clauses remain subject to different interpretations.

Collectively, CDDs, HOAs and community and neighborhood associations represent a set of intervening governance institutions that mediate the impact of fertilizer ordinances on individual behavior. In some ways these institutions can blunt the impacts of ordinances passed by local municipalities but they also hold the potential for enhancing them. The only section of the Florida Statutes dealing with an area directly related to the fertilizer ordinances is § 720.3075, which forbids HOAs from prohibiting Xeriscape[49] or other Florida-friendly lawns. This provision ensures that HOAs cannot interfere with environmentally-conscious homeowners who choose to install Xeriscape.

However, there is nothing in the statute that prohibits HOAs from requiring homes that have grass to only plant certain types of grass (i.e., crabgrass or St. Augustine) or that the grass must be well-kept and free from large brown or dirt spots. Were an HOA to require these actions, as many do, it can and does lead to conflict with the goals articulated by the fertilizer ordinances, even though HOAs are required to respect the fertilizer ordinances in addition to individual homeowners. Legally, HOAs cannot prohibit homeowner compliance with municipal ordinances. They can, however, create conditions that dampen homeowner appetite for significant behavioral change. HOAs can serve as an obstacle to behavioral change by perpetuating a homeowner culture that values conformity with the ideal of a well-manicured, green lawn.

Conversely, HOAs, as well as community and neighborhood associations, hold considerable potential for facilitating change. Legally, Chapter 720 of the Florida Statutes could be amended to forbid HOAs from requiring certain types of grass, requiring the HOAs to pursue BMPs as set forth by various state agencies or to include other environmentally-friendly provisions. Enforcement of such measures could prove difficult, however, and could trigger an antagonistic backlash by property conscious HOAs. A more politically viable approach might include a combination of BMP requirements within the statute or

[49] Xeriscape is "a landscaping method developed especially for arid and semiarid climates that utilizes water-conserving techniques (as the use of drought-tolerant plants, mulch, and efficient irrigation)." Merrian-Webster Online Dictionary, http://www.merriam-webster.com/dictionary/xeriscape .

permitting documents and a concerted educational and political effort to enlist HOAs and their members as partners in the effort to ensure that the new ordinances are followed.

Through permitting contracts and restrictive covenants, state agencies and the HOAs themselves could play a major role in implementing the current ordinances as well as taking steps to curtail the amount of urban stormwater runoff that currently plays a major role in contributing to the overload of phosphates and nitrates in state water bodies and exacerbates the HAB problems existing in offshore waters and the Florida Everglades. Permits already require HOAs to ensure compliance with BMPs; they could also be adjusted to require compliance with different conditions laid out within model ordinances and guidelines articulated by state and federal agencies. In addition, HOA permits could hold the HOAs to the same standards of education regarding fertilizer application as the ordinances currently hold commercial applicators and landscapers.

If a concerted political effort was made to educate the associations about the need for fertilizer restrictions and the role of the community in HAB prevention, HOAs could play a major role in ensuring the viability of the fertilizer ordinances. The HOAs could incorporate the ordinance requirements into their Master Declarations and could take more restrictive steps that ordinances could not. HOAs also could play a major role in educating their homeowners about why the restrictions are so important, and why homeowners should be voluntarily restricting their fertilizer usage.

Permitting agencies such as the FDEP, the Army Corps of Engineers, and the water management districts can build provisions into their permitting schemes that will require HOAs and CDDs to live up to BMPs within their communities. All of the entities mentioned can be active in communities and attempt to achieve political awareness and change in the effort to deal with nutrient loading associated with fertilizer use and its impacts on coastal resiliency.

IV. Conclusion

During the past five years, the state of Florida witnessed a wave of fertilizer ordinances enacted by municipal governments. This article attempts to analyze some of the observable trends in the evolving wave and assess their prospects for improving coastal resiliency. We provide a matrix that illuminates a number of common elements across most if not all of the ordinances. These include an educational component, various application standards and site planning practices, exemption criteria, and enforcement mechanisms.

Between the two generally accepted approaches adopted by the municipalities, the state and SWRPC models, considerable variation exists with respect to the content of these components, especially with respect to application standards, enforcement, and site planning practices. While there is some evidence of proliferation with respect to some of the ordinance components it would appear that the substantive terms of each ordinance are tailored to accommodate both political and ecological conditions within each municipality.

There does not appear to be a clear trend towards expanding the scope or increasing the strigency of the ordinances over time. In fact, in the early stages of this article's preparation it seemed as if the Sarasota County ordinance would be the high watermark of ordinances in terms of scope and stringency. However, the most recently approved ordinances in Charlotte and Lee Counties suggest that such conclusions are premature. Considerable uncertainty remains regarding the reaction of different municipalities to the model ordinance recommended by the FDACS Consumer Fertilizer Task Force as well as that of state legislators in future sessions. Time will tell with respect to the evolution of future ordinances.

With respect to the ultimate impact of Florida's fertilizer ordinances on coastal resiliency, we argue that it will be critical to nest the ordinances within an evolving hierarchy of governance institutions that include Florida's Watershed Management Programs operating on scales that integrate multiple municipal jurisdictions as well as HOAs and CDDs that operating on much smaller scales. Creativity on the part of these private quasi-governmental entities will be essential if the ordinances are to effect lasting and worthwhile change.