



December 10, 2010

Collier County
Attn: Mac Hatcher, Senior Environmental Specialist
3299 Tamiami Trail E
Suite 202
Naples, FL 34112

1450 Merrihue Drive
Naples, Florida 34102
239.262.0304
Fax 239.262.0672
www.conservancy.org

RE: Collier County Fertilizer Ordinance

Dear Mr. Hatcher:

The Conservancy of Southwest Florida, on behalf of our over 6,000 members supports Collier County adopting a stringent and protective fertilizer ordinance to proactively implement pollution source control and prevent the further degradation of southwest Florida waters. Nutrient pollution, which can come from inappropriate fertilizer use, is one of the primary causes of water quality degradation in southwest Florida. Point source and non-point sources of excess nitrogen (N) and phosphorus (P) are recognized as “the most serious pollution problem facing coastal waters worldwide.”¹ In particular, the Environmental Protection Agency considers nitrogen “one of the top stressors in aquatic ecosystems².” Nutrients as a source of pollution have also been cited in several other studies, including GESAMP 1990³, NRC 2000⁴, and Howarth et al 2000⁵.

The connection between nutrient pollution and “eutrophication, harmful algal blooms (HABs), bio-invasions, fish kills, shellfish poisonings, loss of seagrass and kelp beds, coral reef die-off, emerging marine diseases, and marine mammal and seabird deaths,”⁶ is well-known, solidified in studies such as Howarth et al 2000⁷, Lapointe et al 2004⁸,

¹ Lapointe & Bedford, 2006. Drift Rhodophyte Blooms Emerge in Lee County, FL: Evidence of Escalating Coastal Eutrophication. Final Report to Lee County and the City of Bontia Springs.

² US Environmental Protection Agency, 2002. National Water Quality Inventory: 2000 Report. EPA/841/R-02/001. Office of Water, Washington, DC.

³ GESAMP, 1990. The State of the Marine Environment. Joint Group of Experts on the Scientific Aspects of Marine Pollution Rep. Stud. 39. UNEP.

⁴ National Research Council, 2000. Clean Coastal Waters: Understanding and Reducing the Effects of Nutrient Pollution. Ocean Studies Board, Water Science and Technology Board.

⁵ Howarth et al, 2000. Nutrient Pollution of Coastal Rivers, Bays, and Seas. Issues in Ecology 7, 1-15.

⁶ Lapointe & Bedford, 2006. Drift Rhodophyte Blooms Emerge in Lee County, FL: Evidence of Escalating Coastal Eutrophication. Final Report to Lee County and the City of Bontia Springs.

⁷ Howarth et al, 2000. Nutrient Pollution of Coastal Rivers, Bays, and Seas. Issues in Ecology 7, 1-15

Lapointe et al 2005,⁹ Vitousek et al, 1997¹⁰, and Carpenter et al, 1998¹¹. “With more than 50 marine and 20 freshwater harmful algal species documented, Florida’s Harmful Algal Blooms (HAB) have the potential to affect public health, cause economic losses, and affect living marine, freshwater, and terrestrial resources.”¹² The devastating economic, human health and environmental impacts of algal blooms is well-documented (Fleming et al, 1998¹³, Steidinger et al, 1999¹⁴, Williams et al, 2001¹⁵, Backer et al¹⁶, 2003, Kirkpatrick et al 2004¹⁷, Landsberg et al, 2006¹⁸). One report, Hoagland et al 2002¹⁹, estimated that between 1987 and 1992, the average annual loss of revenue from HABs in the United States was about \$50 million dollars.

Red tide was reported in the Gulf off of Collier County in October, 2009²⁰. It was also reported closer to the coast in early 2010 and resulted in respiratory irritation to beachgoers and a small fish kill²¹. There are many factors that contribute to HAB occurrence, including blue-green algae growth. A peer-reviewed study by Gilbert et al

⁸ Lapointe et al, 2004. Anthropogenic Nutrient Enrichment of Seagrass and Coral Reef Communities in the Lower Florida Keys: Discrimination of Local Versus Regional Nitrogen Sources. *J. Exp. Mar. Biol. Ecol.* 308 (1), 23-58.

⁹ Lapointe et al, 2005. Macroalgal Blooms on Southeast Florida Coral Reefs. Nutrient Stoichiometry of the Invasive Green Alga *Codium Isthmocladium* in the Wider Caribbean Indicates Nutrient Enrichment. *Harmful Algae* 4, 1092-1105.

¹⁰ Vitousek et al, 1997. Human Alteration of the Global Nitrogen Cycle: Causes and Consequences. *Issues in Ecology* 1:1-15.

¹¹ Carpenter et al, 1998. Nonpoint Pollution of Surface Waters with Phosphorus and Nitrogen. *Issues in Ecology* No. 3, Ecological Society of America, Washington, DC.

¹² Fish and Wildlife Research Institute, 2009. Resource Guide for Public Health Response to Harmful Algal Blooms in Florida. Based on Recommendations of the Florida Harmful Algal Bloom Task Force Public Health Technical Panel. FWRI Technical Report TR-14.

¹³ Fleming et al, 1998. Marine Seafood Toxin Diseases: Issues in Epidemiology and Community Outreach. From *Environmental Health Resources for Community Outreach and Education Marine Science*. NIEHS. P. 5.

¹⁴ Steidinger et al, 1999. Harmful Algal Blooms in Florida. Unpublished Technical Report Submitted to the Florida Harmful Algal Bloom Task Force. Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute. P. 63.

¹⁵ Williams et al, 2001. Assessment of Cyanotoxins in Florida’s Lakes, Reservoirs, and Rivers. Final Report to the St. John’s River Water Management District, Palatka, Florida. Cyanobacterial Survey Project, Florida Harmful Algal Bloom Task Force, Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute. P. 97.

¹⁶ Backer et al, 2003. Epidemiology, Public Health and Human Illness Associated with Harmful Marine Algae. From *Manual on Harmful Marine Microalgae*. Intergovernmental Oceanographic Commission of UNESCO. P. 723-750.

¹⁷ Kirkpatrick et al, 2004. Literature Review of Florida Red Tide Implications for Human Health. *Harmful Algae* 3:99-115.

¹⁸ Landsberg, et al, 2006. Saxitoxin Puffer Fish Poisoning in the United States, With the First Report of *Pyrodinium bahamense* as the Putative Toxin Source. *Environmental Health Perspectives* 114:1502-1507.

¹⁹ Hoagland et al, 2002. The Economic Effects of Harmful Algal Blooms in the United States Estimates, Assessment Issues, and Information Needs. *Estuaries* 25(4): 819-837.

²⁰ Naples Daily News (October 14, 2009). Red Tide Reported 30 Miles Off Collier Shores.

²¹ Naples Daily News (February 9, 2010). Red Tide Makes a Comeback in Collier. Naples Daily News (January 27, 2010). Red Tide Hangs On Off Collier Coast.

2009,²² found that cyanobacterial blooms, such as *Synechococcus*, which are prevalent along with the southwest Florida coast, increase the likelihood for *Karenia brevis* (red tide) growth. “With evidence that blooms of *Synechococcus* can be enhanced due to anthropogenic nutrients, the potential importance of this particulate nutrient source for sustaining red tide blooms in situ is large....”²³ The benefits of controlling excessive algal growth that may contribute to potential harmful algal bloom events, should be considered when discussing fertilizer regulations.

Collier County Ordinance Should Mirror Effective and Protective Regional Ordinances

Creating a fertilizer ordinance and associated education/outreach effort is one of the most important steps a community can undertake in protecting its water quality and quality of life. The “primary impetus” for the wave of southwest Florida fertilizer ordinances was based on an effort to address regional water quality by the Southwest Florida Regional Planning Council (SWFRPC). Utilizing scientific literature and after review by the Institute of Food and Agricultural Sciences (IFAS) and the Florida Department of Environmental Protection (DEP)²⁴, the SWFRPC adopted “a resolution that provided a [regional] model ordinance for fertilizer use regulation that was approved by all 22-member jurisdictions on March 15, 2007.”²⁵ Collier County voted in support of this fertilizer resolution that promoted effective and protective measures. Many southwest Florida municipalities²⁶ have subsequently adopted stringent fertilizer ordinances, modeled closely to the SWFRPC resolution, to address water quality protection. The SWFRPC resolution and many of these ordinances have included elements for an effective fertilizer ordinance, including: 1) prohibition of application during the rainy season, 2) fertilizer-free buffer zone of at least 10 feet to protect runoff into adjacent waterbodies, 3) a cap on phosphorus fertilizer content to less than 2%, 3) fertilizer content of at least 50% slow-release nitrogen, 4) limiting the total amount of fertilizer that can be applied to no more than 4lbs/1,000sqft per year. Most southwest Florida ordinances also include education and certification components, as well as regulations on the control of fertilizers on impervious surfaces.

The State Model Ordinance, alternatively, does not require these same essential elements of an effective ordinance. The State Model Ordinance is the minimum for fertilizer ordinances passed after January 1, 2009²⁷. “The statewide model ordinance is, of

²² Gilbert et al 2009. Grazing by *Karenia Brevis* on *Synechococcus* Enhances Its Growth Rate and May Help to Sustain Blooms. *Aquatic Microbial Ecology*. Vol. 55:17-30.

²³ Gilbert et al 2009. Grazing by *Karenia Brevis* on *Synechococcus* Enhances Its Growth Rate and May Help to Sustain Blooms. *Aquatic Microbial Ecology*. Vol. 55:17-30. P. 18.

²⁴ Personal communication, October 20, 2009. Jim Beever, SWFRPC, Phone.

²⁵ Hartman et al, 2008. The Spread of Fertilizer Ordinances in Florida. *Sea Grant Law and Policy Journal*, Vol. 1., No. 1.

²⁶ Including City of Naples, Lee County, City of Bonita Springs, Town of Fort Myers Beach, City of Fort Myers, Charlotte County, Sarasota County, and City of Cape Coral, etc. City of Marco Island is currently in the process of adopting a fertilizer ordinance.

²⁷ Fl. Stat. §403.9337(2). “Each county and municipal government located within the watershed of waterbody or water segment that is listed as impaired by nutrients pursuant to s. 403.067, shall, **at a minimum**, adopt the department’s Model Ordinance for Florida-Friendly Fertilizer Use on Urban Landscapes” (emphasis added).

necessity, a generic document,”²⁸ which is meant to provide the minimum baseline provisions for proposed fertilizer ordinances. The State Model is the floor, but not the ceiling; the state statute language and the State Model Ordinance, itself, provides assurance that local municipalities may adopt more stringent measures to adequately protect their water resources. The Model goes on to recommend, additionally, that “local government[s] should consider the disadvantages of confusing jurisdictional differences²⁹” when constructing their ordinance. Lee County to the County’s north and the incorporated City of Naples within the County have similar ordinances that are both more stringent than the State Model. Additionally, the incorporated City of Marco Island is in the process of adopting a fertilizer ordinance that is nearly identical to the City of Naples’. By adopting a fertilizer ordinance akin to these existing ordinances, Collier County will be following FDEP recommendation to this regard.

The State Model Ordinance also recommends that more stringent ordinances may be appropriate when municipalities have “verified impaired waters and are facing existing or possible TMDL requirements.... Verified harm to human health or harm to the environment... or they will improve water quality or prevent future impacts of fertilizers on the environment³⁰.” With 32% of the County not meeting state water quality standards for nutrients or impaired as a result of nutrients, Collier would certainly qualify.

The criteria to meet the statutory test for more stringent ordinance language includes:

1. that local government demonstrate more stringent measures are part of a science-based, economically- and technically-feasible comprehensive program to address non-point source pollution³¹. The legislative findings at Sect. 403.9336 also indicate that “local conditions, including variations in the types and quality of water bodies, site-specific soils and geology, and urban or rural densities and characteristics, may necessitate the implementation of additional or more stringent fertilizer management practices at the local government level³².”
2. that the government has considered all relevant information, including scientific information and input from DEP, IFAS and the Department of Agriculture and Consumer Services (DACs) in their decision-making and that all information considered in determining the cause for more stringent ordinance language be on the record³³.

The Conservancy offers this letter, citing many documents from these entities, as relevant information to be utilized in this process.

With red tide in the Gulf, and with a third of the County already experiencing impairments related to nutrient pollution (see attachment A), there are significant threats

²⁸ Personal communication, October 15, 2009. Michael Thomas, DEP, Email.

²⁹ DEP, January 2009. Florida-Friendly Landscape Guidance Models for Ordinances. P. 23.

³⁰ DEP, January 2009. Florida-Friendly Landscape Guidance Models for Ordinances. P. 23.

³¹ Fl. Stat. §403.9337(2)(a).

³² Fl. Stat. §403.9336.

³³ Fl. Stat. §403.9337(2)(b).

to the health of Collier County's aquatic ecosystem. Fertilizer ordinances are proactive measures for pollution prevention. Collier County would meet each one of these thresholds for implementing a fertilizer ordinance that is more stringent than the State Model. The County should begin to address its impairment issues by adopting a fertilizer ordinance that contains all the necessary components of an effective fertilizer ordinance.

Collier County Meets Statutory Requirement for a More Stringent Ordinance

Collier County meets the statutory language embodied in Fl. Stat. §403.9337(2)(a), because it has elements of a comprehensive program that work in tandem to address and reduce non-point source pollution. The following already-established Collier County regulations and programs contribute to the County's "comprehensive program" and are available in detail in Attachment C:

- Land Development Code §4.06.05 General Landscaping Requirements, which recommends use of native, drought-tolerant, and site-specific plant species in landscaping to encourage low maintenance management. These regulations also encourage proper use swale systems to reduce nutrient loading into wetland preserves.
- Land Development Code §3.05.07, implements buffers to protect wetlands adjacent to developments.
- Code of Ordinances, §90-121 Collier County Water Irrigation Ordinance, promotes conservation of water resources through irrigation water use restrictions.
- Code of Ordinances, §54-60 Collier County Water Pollution Control Ordinance, provides pollution control measures for sewage treatment loading sources.
- Code of Ordinances, §118-56 Collier County Litter Control Ordinance, which protects against dumping of grass clippings and other litter into waterbodies.
- Freedom Park/Gordon River Water Quality Park construction, a 50-ac area that has been converted to filter marsh to provide stormwater runoff treatment.
- Website educational measures that promote the Florida Yards & Neighborhoods Program, and smart use of fertilizers.
- Surface water monitoring program and red tide monitoring.

Collier County clearly has the ability under state law to move forward with a fertilizer ordinance that is more stringent than the State Model Ordinance. Therefore, the Conservancy proposes that the following more-effective and protective elements be included in the proposed Collier County fertilizer ordinance:

1. *No person shall apply fertilizers containing nitrogen and/or phosphorus to lawn, turf and/or landscape plants during the Rainy Season and the Prohibited Application Period, or to saturated soils.*
2. *No fertilizer shall be applied in or within ten (10) feet from the edge of any waterbody or seawall.*
3. *Fertilizers applied to lawn, turf, and/or landscape plants within the County shall*

contain no phosphorus per guaranteed analysis label.

4. *Fertilizers applied to lawn, turf and/or landscape plants within the County shall contain no less than fifty (50) percent slow release nitrogen per guaranteed analysis label.*
5. *Fertilizers should be applied to lawn, turf and/or landscape plants at the lowest rate necessary without exceeding the maximum rate per application. Fertilizer shall not be applied at a rate greater than one (1) pound of nitrogen per 1,000 square feet per application. No more than four (4) pounds of nitrogen per 1,000 square feet shall be applied to any lawn, turf or landscape area in any calendar year.*

Support for Slow Release Nitrogen Fertilizer Content

The use of slow-release nitrogen and low content phosphorus is supported by several scientific studies. The 2008 DEP Florida-Friendly BMP manual³⁴, Florida Yards and Neighborhoods Handbook³⁵, in addition to Institute of Food and Agricultural Sciences (IFAS) studies³⁶, support the use slow-release nitrogen. Slow-release nitrogen is nitrogen in a form that adds nutrients into the soil slowly over time. Also known as water-insoluble nitrogen, it is formed by coating the nitrogen granules with sulfur or plastic-based materials that break down over time.³⁷ Because slow-release nitrogen takes time to activate and provide nutrient components to the soil, many advocate its use over a quick-release nitrogen product that could leach and run off more quickly, causing water quality concerns.

Fertilizers with a high percentage of slow release nitrogen are less likely to leach or runoff into Florida's waters.³⁸ DEP recommends that "to limit the environmental impact of your fertilization program, it is recommended that no more than 0.5 pounds of water-soluble N per 1,000 square feet be applied in a normal application."³⁹ A 2007 IFAS publication also recommends utilizing 50% slow-release nitrogen.⁴⁰ However, the State Model Ordinance allows up to 0.7 pounds of readily available nitrogen per application and does not require use of slow-release nitrogen to this level. This equates to only about 30% slow-release product. Slow-release nitrogen products are readily available on the

³⁴ DEP, 2008. Florida Friendly Best Management Practices for Protection of Water Resources by the Green Industries.

³⁵ IFAS, 2006. A Guide to Florida-Friendly Landscaping: Florida Yards and Neighborhoods Handbook.

³⁶ Sartain, 2007. General Recommendations for Fertilization of Turfgrasses on Florida Soils. IFAS, University of Florida. P. 3.

³⁷ IFAS, 2007. The Florida Fertilizer Label. Soil and Water Science Department, Florida Cooperative Extension Service, IFAS, University of Florida.

³⁸ DEP, 2008. Florida Friendly Best Management Practices for Protection of Water Resources by the Green Industries. P. 29; IFAS, 2006. A Guide to Florida-Friendly Landscaping: Florida Yards and Neighborhoods Handbook.

³⁹ DEP, 2008. Florida Friendly Best Management Practices for Protection of Water Resources by the Green Industries. P. 29

⁴⁰ Sartain, 2007. General Recommendations for Fertilization of Turfgrasses on Florida Soils. IFAS, University of Florida. P. 3.

market and although the cost may be more per bag, it is actually more cost efficient for the consumer as less product is needed (see Figure 1).

Figure 1 Showing Total Cost Per Area Comparison Between Controlled Release Fertilizer Product and Conventional Fertilizer Product

Florikan Landscape Fertilizer Calculator												
BROADCAST (lbs of N per 1000 sq. ft.)	Florikan All Purpose				Granular				Sulfur Coated Urea "Competitor"			
Fertilizer N-P-K Analysis	12	2	14	12 Month	10	10	10	2 Month	12	2	14	3 Month
Required Lbs of N per Application (1000 sq. ft.)	2.10				1.25				1.25			
Average Fertilizer Price per 50lb Bag	\$55.00				\$12.50				\$23.50			
Number of Applications Required Annually	1				6				4			
Fertilizer Cost Per Application (1000 sq. ft.)	\$19.25				\$3.13				\$4.90			
Required Broadcast Rate - Lbs. per 1000 sq. ft.)	17.5				12.5				10.4			
Total Lbs of Nitrogen per Application (1000 sq. ft.)	2.10				1.25				1.25			
Total Lbs of Nitrogen per Application (1000 sq. ft.) Annually	2.10				7.50				5.00			
Fertilizer Cost per 1000 sq. ft. (Annually)	\$19.25				\$18.79				\$19.58			
Cost of Labor per Application (Annually)	\$0.50				\$0.50				\$0.50			
Labor Cost per Application (1000 sq. ft.)	\$0.50				\$3.00				\$2.00			
TOTAL COST (ANNUALLY) PER 1000 SQ. FT.	\$19.75				\$21.75				\$21.58			
TOTAL COST (ANNUALLY) PER ACRE	\$860.31				\$947.43				\$940.17			

Support for Minimal or Zero Phosphorus Fertilizer Content

Soils throughout Florida generally contain enough phosphorus that fertilization with additional phosphorus is not necessary to maintain a healthy state. "Due to their marine origin, Florida soils often test high in... P."⁴¹ Therefore, as DEP has recommended, phosphorus "application should be limited to soils that require additional P based on soil or tissue testing."⁴²

Unfortunately, the State Model Ordinance allows for additional phosphorus loading on already phosphorus-rich soils up to 0.50 lbs per year. "Excess P application can result in enrichment of the P status of run-off or leachate [in] waters, and in the eutrophication of adjacent waterbodies."⁴³ Language proposed by the Conservancy recommends that phosphorus content in fertilizer be limited to 0%. This is being pursued by the City of Marco Island in their fertilizer ordinance. Furthermore, in 2009, a state-wide year-round ban on phosphorus application was supported by a broad coalition of varied interests,

⁴¹ Sartain, 2008. Soil and Tissue Testing and Interpretation for Florida Turfgrasses. IFAS, University of Florida.

⁴² DEP, 2008. Florida Friendly Best Management Practices for Protection of Water Resources by the Green Industries

⁴³ IFAS, 2007. General Recommendations for Fertilization of Turfgrasses on Florida Soils. IFAS, University of Florida.

including Florida Stormwater Association, United Waterfowlers, Florida Ducks Unlimited, Recreational Fishing Association, Snook Foundation, Marine Resources Council, Florida Coastal and Oceans Coalition, Florida Wildlife Federation, Audubon of Florida, Surfriders, St. Johns Riverkeepers, Friends of Billy's Creek, Lee Paddle Sports Alliance, PURRE Water Coalition Foundation, Inc., Outdoor Life Magazine, Florida Sportsman Magazine, Sierra Club, Caloosahatchee River Citizens Association/Riverwatch⁴⁴. There is clearly consensus that minimal or zero phosphorus fertilization is appropriate for Florida. Exemptions for specific plots that, through a soil test, show a deficient amount of phosphorous may be allowed to fertilize up to the maximum allowed under the State Model Ordinance. Collier County should move forward with further minimizing the application of phosphorus through more stringent fertilizer content regulation.

Support for 4 lb Cap on Fertilizer Application Per Year

The Urban Turf Rule⁴⁵, the Florida Yards and Neighborhoods Handbook, as well as others sources can be utilized to support an application rate of 4 lbs of nitrogen for most types of grasses per year. The State Model Ordinance allows for fertilizing up to 6 lbs of nitrogen per year for St. Augustine grass, and up to 7 lbs of nitrogen for Bermuda grass. In order to avoid over-fertilization based on the State Model Ordinance application rates, the Conservancy supports placing a cap on the annual amount that can be applied to 4 lbs. This cap echoes the minimums established in the Urban Turf Rule and reflects the minimum amount of nitrogen needed for healthy turf grasses. Note that the Urban Turf Rule is based on turf grass science, and does not consider the nutrient load maximums that may adversely impact local waterbodies. The Conservancy also encourages the use of low maintenance zones and the use of plants that require minimal maintenance and fertilizer/pesticide application.

Support for Minimum Buffer Adjacent to Waterbodies

Buffer areas adjacent to water resource areas "function[] by removing sediments and associated pollutants from surface water runoff, removing, detaining, or detoxifying nutrients and contaminants from upland sources."⁴⁶ A buffer area is put in place to mitigate against application error and prevent runoff. There are a significant amount of sources that support buffer areas as nutrient filters, including Belt et al 1992⁴⁷, Johnson & Ryba 1992⁴⁸, Castelle et al 1994⁴⁹, Fennessy & Cronk 1997⁵⁰, Fischer & Fischenich 2000⁵¹, and Christensen 2000⁵².

⁴⁴ Sierra Club, 2009. Critique of IFAS Publication ENH115. P. 1.

⁴⁵ FAC 5E-1.003.

⁴⁶ Environmental Law Institute, 2008. Planner's Guide to Wetland Buffers for Local Governments. P. 1.

⁴⁷ Belt et al, 1992. Design of Forest Riparian Buffer Strips for the Protection of Water Quality: Analysis of Scientific Literature. Idaho Forest, Wildlife, and Range Policy Group Report No. 8, University of Idaho, Moscow, ID.

⁴⁸ Johnson & Ryba, 1992. Literature Review of Recommended Buffer Widths to Maintain Various Functions of Stream Riparian Areas. Water and Land Resources Division, King County Department of Natural Resources, Seattle, WA.

The SWFRPC recommendation of a 25-foot buffer was drawn from Environmental Resource Permit Basis of Review rules by the South Florida Water Management District, which is put in place to ensure that upland uses do not adversely impact adjacent water resources. Scientific literature shows that much of the nutrient removal occurs within the first 15-30 feet⁵³. Buffers of at least 15 feet reduced subsurface nitrate flows by up to 80%⁵⁴.

Although sources suggest that the benefits reaped from buffer zones increase with the width of the buffer, Green Industry Best Management Practices (BMP) suggests buffer zones of at least 6 to 10 feet [can] protect water resources⁵⁵. Most of the southwest Florida ordinances utilize a buffer zone of at least 10 feet to protect vulnerable coastal waters. While some may be concerned with the inability to fertilize in the buffer zone, turf and other plants within the zone may receive nutrient nourishment from other sources, for example, sloughing of fertilizer applied landward of the buffer zone or from rain deposits.

Support for the Rainy Season Prohibition

The State Model Ordinance only prohibits fertilizing during major storm events, such as floods, hurricanes, or tropical storms, or when rain fall is expected to be more than 2 inches⁵⁶. No scientific study supporting that runoff only occurs after 2 inches of rainfall exists; cumulative inundation of soils from smaller rain events may contribute to

⁴⁹ Castelle et al, 1994. Wetland and Stream Buffer Size Requirements – a Review. *Journal of Environmental Quality* 23:878-882.

⁵⁰ Fennessy and Cronk, 1997. The Effectiveness and Restoration Potential of Riparian Ecotones for the Management of Nonpoint Source Pollution, Particularly Nitrates. *Critical Reviews in Environmental Science and Technology* 27:285-317.

⁵¹ Fischer & Fischenich, 2000. Design Recommendations for Riparian Corridors and Vegetated Buffer Strips. Technical Note ERDC-TN-EMRRP-SR-24, Army Engineer Waterways Experiment Station, Vicksburg, MS.

⁵² Christensen, 2000. Protection of Riparian Ecosystems: a Review of the Best Available Science. Jefferson County Natural Resources Division, Port Townsend, WA.

⁵³ Environmental Law Institute, 2008. *Planner's Guide to Wetland Buffers for Local Governments*. P. 7.; Dillaha et al., 1988. Evaluation of Vegetative Filter Strips as Best Management Practice for Feed Lots. *Journal of the Water Pollution Control Federation* 60(7): 1231-1238.; Dillaha et al, 1989. Vegetative Filter Strips for Agricultural Nonpoint Source Pollution Control. *Transactions of the ASAE* 32:513-519. ; Magette et al, 1989. Nutrient and Sediment Removal by Vegetated Filter Strips. *Transactions of the ASAE* 32(2): 663-667. ; Schoonover et al, 2006. Agricultural Sediment Reduction by Giant Cane and Forest Riparian Buffers. *Water, Air, and Soil Pollution* 169: 303-315.

⁵⁴ Muscutt et al, 1993. Buffer Zones to Improve Water Quality: A Review of Their Potential Use in UK Agriculture. *Agriculture, Ecosystems, and Environment*. 45:59-77. ; Parkyn, 2004. Review of Riparian Buffer Zone Effectiveness. Ministry of Agriculture and Forestry Technical Paper No. 2004/05, Wellington, New Zealand.

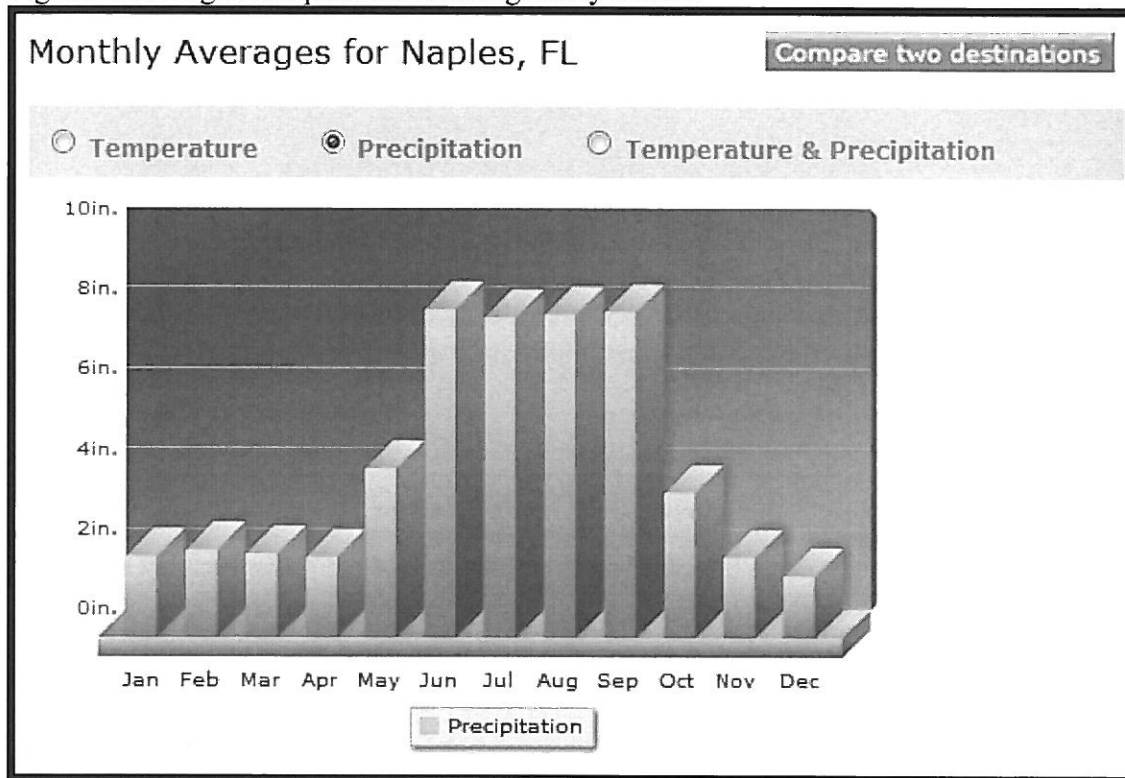
⁵⁵ Green Industries of Colorado, 2008. *Green Industry Best Management Practices for the Conservation and Protection of Water Resources in Colorado: Moving Toward Sustainability*.

⁵⁶ DEP, January 2009. *Florida-Friendly Landscape Guidance Models for Ordinances, Covenants, and Restrictions*.

stormwater run-off⁵⁷. However, there is scientific support for prohibiting fertilizer application during other times of the year when rainy weather is likely.

A blackout period would address frequent rainstorms washing fertilizer into adjacent waterbodies during the typical rainy season. The rainy season in Collier County is generally from June through September with 32.4 inches, or 62%, of average annual rainfall for Collier County falling within this period (see Figure 2). DEP has stated that, of all places in Florida, the prohibition for rainy season application makes the most sense for southwest Florida, considering its normal rain cycles⁵⁸.

Figure 2 Average Precipitation Showing Rainy Season⁵⁹



Furthermore, limiting prohibitions to rainfall events greater than 2 inches, severely limits the ability to control runoff during the most common rain events. About half of southwest

⁵⁷ Southwest Florida Regional Planning Council, November 18, 2010. 2010 FDEP Model Ordinance for Florida-Friendly Use of Fertilizer on Urban Landscapes. Letter to Mike Thomas, DEP.

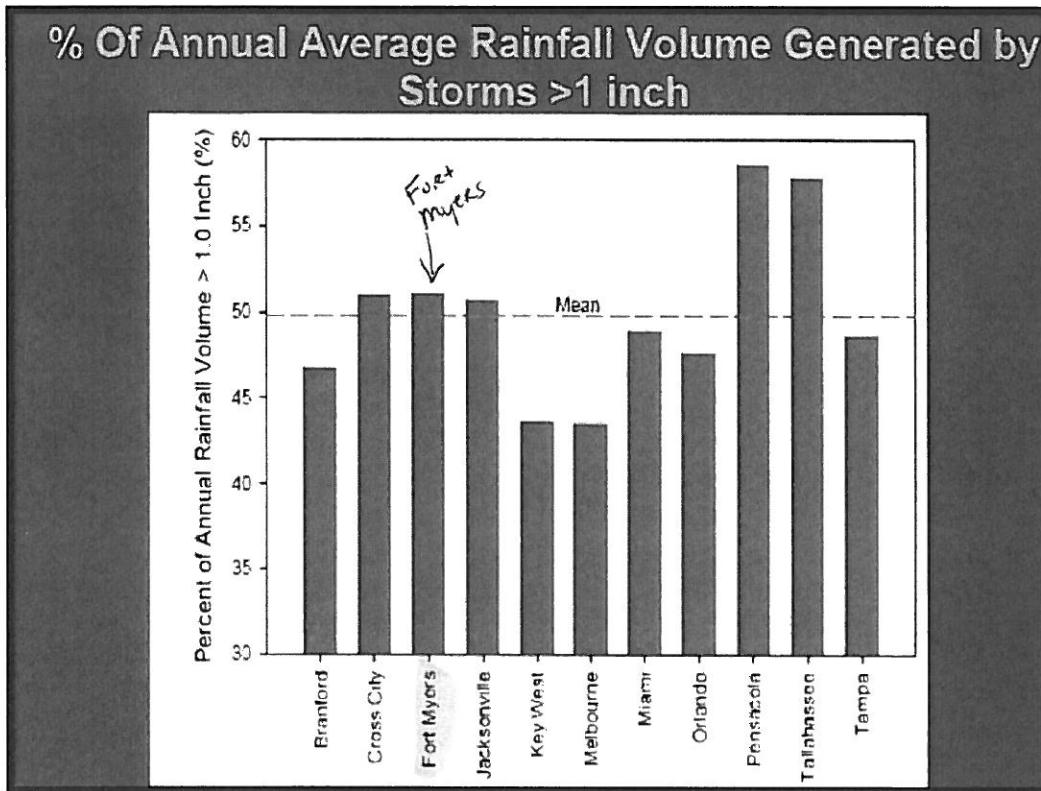
⁵⁸ Personal communication, October 13, 2009. Michael Thomas, DEP, phone.

⁵⁹ The Weather Channel. <

<http://preview.weather.com/outlook/travel/vacationplanner/vacationclimatology/monthly/USFL0338> >. Accessed December 8, 2010.

Florida’s rain events contribute greater than an inch of rain to the landscape (see Figure 3), however only 3 to 5% of Florida’s rain events exceed two inches⁶⁰.

Figure 3 Annual Average Rainfall Volume By Florida Location⁶¹



Application of (urea) fertilizer followed by rainfall of an inch or greater within 8-12 hours, may cause nitrogen to “move below the turfgrass root zone because of its non-ionic nature and be lost through leaching.”⁶² Many sources, including a study from IFAS, can be utilized to support the prohibition for rainy season application. “Fertilization with N in the summer is not always desirable since this often encourages disease and insect problems.”⁶³ Instead, a slow-release fertilizer could be applied before June 1st and provide steady nutritional aid during the black-out period while decreasing risk of disease and insect infestation. Additional support for the black out period can be found in Attachment B.

⁶⁰ DEP, 2008. Florida Friendly Best Management Practices for Protection of Water Resources by the Green Industries. P. 30. Fort Myers is the closest available data to Collier County in this table provided by DEP.

⁶¹ Thomas, DEP. Nonpoint Source Management Section Presents Florida’s Urban BMPs: Homeowners, Landscaping, Golf, and the Future of Stormwater. Powerpoint.

⁶² DEP, 2008. Florida Friendly Best Management Practices for Protection of Water Resources by the Green Industries. P. 26.

⁶³ IFAS, 2007. General Recommendations for Fertilization of Turfgrasses on Florida Soils. Soil and Water Science Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida.

Additionally, grass clippings can be utilized to provide nutrients to turf during the rainy season application prohibition. Grass clippings are a significant source of nitrogen that will improve soil fertility over time and reduce the need for nitrogen fertilization by up to 50% without a decrease in turf grass quality⁶⁴.

Publications throughout the country provide evidence that up to 1 to 2 pounds of nitrogen per 1000 sq ft can be provided back to lawns from decomposed grass clippings⁶⁵. As you are aware, more grass clippings are produced in our rainy season than any other time of the year.

In reference to the IFAS document entitled *Unintended Consequences Associated with Certain Urban Fertilizer Ordinances*, the State Model Ordinance suggests that these considerations are “an *equally* important factor⁶⁶” as the blackout period. While the scientific integrity of this document has been questioned⁶⁷, the study does not conclude conclusively that “black out periods” negatively effects turf grass or water quality. In fact, DEP staff has suggested that the rainy season ban helps to reduce nutrient runoff during the ban season⁶⁸. There is anecdotal evidence, in addition to the scientific literature mentioned above, that supports the blackout period. Sarasota County passed their fertilizer ordinance in 2007, which included a rainy season application prohibition. They have released a State of the Bay report in 2010 that not only confirms that their fertilizer ordinance has improved their local water quality, but also that lawns have not experienced a dramatic change.

Because science is not available to support the benefits of healthy turf grass as a better deterrent to water pollution than the rainy season application prohibition, the ordinance language should include the prohibition because it is better supported by available science and is easier for applicators to predict and follow. To meet the minimum established in the State Model Ordinance and to protect more fully against nutrient runoff during storm events, it is advisable to add State Model Ordinance language to prohibit application of fertilizer during floods, hurricanes and tropical storms. The Conservancy’s proposed language includes both provisions.

Conclusion

The Conservancy of Southwest Florida supports Collier County in implementing an effective, scientifically-supported fertilizer ordinance to best protect its water quality. The scientific sources referenced in this letter can provide a legal basis for enacting these more stringent measures. Additional information may exist that can be utilized to further support the County in its efforts to enact more stringent measures than the State Model

⁶⁴ IFAS, 2006. Florida Yards and Neighborhoods Program Handbook.

⁶⁵ Swift, 1996. Updated 2009. Colorado State University Extension.

⁶⁶ DEP, January 2009. Florida-Friendly Landscape Guidance Models for Ordinances, Covenants, and Restrictions. P. 23. Emphasis added.

⁶⁷ Michael Thomas, DEP has stated in regards to *Unintended Consequences* “The document is not a research report. It is more of a white paper that raises pointed questions for which we generally do not have data for hard answers.” Email, October 23, 2009.

⁶⁸ Personal communication, October 23, 2009. Michael Thomas, DEP, email.

Ordinance. The proposed language and changes we have suggested in the letter will meet the minimum established in the State Model Ordinance, as required by state statute. Based on its existing comprehensive programs to address non-point source nutrient pollution, Collier County can meet the state statute language and we encourage the County to move forward with adopting these fertilizer regulations.

If you have any questions, please feel free to contact me at (239)262-0304 ext. 286.

Sincerely,



Amber Crooks
Natural Resources Specialist

Cc:

Leo Ochs, County Manager
Jennifer Hecker, Conservancy of Southwest Florida
Cris Costello, Sierra Club
Marti Daltry, Sierra Club

Attachment A:

Collier County Impairments Related to Nutrients

