

# It's Time To End The Slime



A Primer On EPA's Proposed Rule  
To End Sewage, Fertilizer And Animal Manure Pollution  
Of Florida's Waters:

The Problem, Its Causes, And Practical Solutions

## Toxic Algae on the Caloosahatchee River



## The Problem

In 2008, testing by the Florida Department of Environmental Protection revealed that 1,000 miles of the state's rivers and streams, 350,000 acres of Florida's lakes and 900 square miles of its estuaries were contaminated by sewage, fertilizer or manure pollution. "The actual number of miles and acres of waters impaired [by these pollutants] is likely higher," the DEP noted, "as many waters that have yet to be assessed may also be impaired." All across Florida, the effects of this pollution can be felt and these effects jeopardize public health, our ability to swim and boat in lakes and rivers, and undermine our tourist economy.

Algae outbreaks plague many of our lakes, rivers and springs. The outbreaks can make boating and swimming dangerous or impossible, result in massive fish kills, and cause permanent reductions in waterfront property values. From coast to coast, Floridians are horrified to see their beloved lakes and rivers turn to green slime. For example, almost the whole Caloosahatchee River in Southwest Florida recent suffered a massive blue-green algae outbreak. The St. Lucie River and estuary also suffered a massive toxic algae outbreak which caused a permanent loss of a half billion dollars in waterfront property values.

Some of these algae outbreaks can be toxic. Exposure to toxic algae can cause rashes, skin and eye irritation, allergic reactions and gastrointestinal upset. Swimming can cause serious illness or even death if water is ingested. Some algae are known tumor promoters, producing "neurotoxins" which interfere with nerve cell function and "hepatotoxins" which attack the liver. During the St. Lucie River outbreak, the



**Beach closure due to Red Tide**

County Health Department posted signs warning against contact with the water. Visitors to Wakulla Springs – for a century hailed as one of Florida's Crown Jewels – reported getting skin rashes after swimming in the spring. The rashes were attributed to toxic algae triggered by sewage pollution. Farther south, over twenty similar incidents were reported at Ichetucknee Springs. There, the outbreak was from unregulated manure from industrial dairy operations. For the past several years, major portions of the St. Johns River suffered from a massive toxic blue-green algae outbreak which was dubbed "The Green Monster" for the fluorescent green slime created on the surface of the water. Toxin levels were recorded at 50 – 140 times above the World Health Organization's recommended limits and many people reported respiratory problems, raw throats, and irritated eyes. Boat traffic on stretches of the St. Johns River has had to be shut down due to algae outbreaks.



**A toxic algae outbreak forced closure of the water treatment plant at Olga**

The effects are by no means limited to freshwaters. Red tide and red drift algae have been linked to nutrient pollution on Florida beaches.

The stench produced by red drift algae smells like raw sewage and drives away beachgoers. Red tide causes respiratory problems and often results in closed beaches during the tourist season. These closures have a devastating effect on the tourist economy because most beachgoers come from out-of-state or from Europe and return home with horror stories about Florida beaches.



**Sewage isn't treated well enough**

Fertilizer, sewage and animal manure pollution can also endanger drinking water. Algae outbreaks are drawn into water intake pipes and attempts to disinfect the algae-laden water often cause the algae to suddenly release dangerous toxins. In June 2008, a water treatment plant serving

30,000 people was forced to shut down after a toxic blue-green algae outbreak on the Caloosahatchee River made the drinking water plant unusable. The cost of upgrading one single drinking water plant in California to address drinking water contamination caused by nutrient-fueled algae outbreaks was over \$200 million.



**Fertilizer is applied to lawns and agricultural operations. Most of it is washed off by rainfall.**

## Its Causes

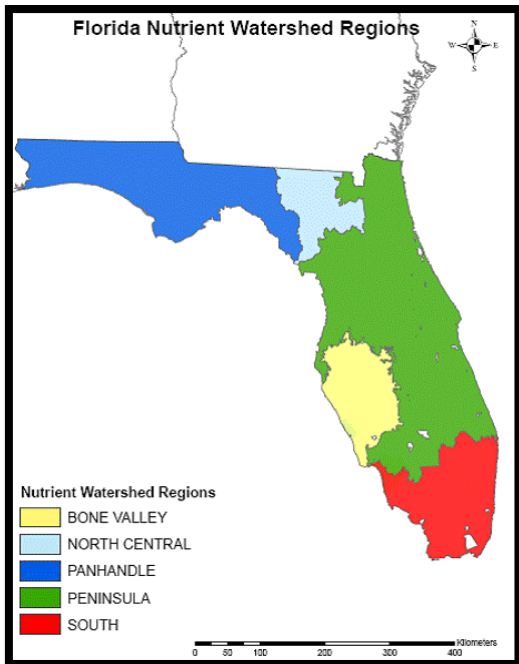
**Sewage.** Even after sterilization and removal of solids, sewage effluent still contains very high levels of phosphorus and nitrogen – the essential components of fertilizer. Insufficiently treated sewage effluent is often allowed to be discharged directly into rivers or piped into near-shore coastal areas. The result is a ready food source for nuisance species such as algae. Even the solid residue of water treatment, known as sludge or “biosolids,” contains very high levels of phosphorus and nitrogen. Often this sludge residue is disposed of on land or marketed as fertilizer. When it rains, sludge gets washed into rivers and lakes, where it acts as a potent fertilizer.

**Fertilizer.** Floridians use huge amounts of fertilizer to keep their yards green. Florida's agricultural sector also applies vast amounts of fertilizer on everything from tomatoes to pine trees. And then there's the golf courses! Most fertilizer is applied at the wrong time and in excessive amounts. As a result, most of it is washed off into rivers, lakes and estuaries. Fertilizing in the summer rainy season is almost the same as dumping fertilizer directly into the nearest stream. The result is like Miracle-Gro for algae.

**Manure.** Florida agricultural operations included large numbers of industrial-scale dairy operations and huge beef cattle calving operations. These operations produce massive amounts of manure. When manure is not correctly handled on site, it washes into groundwater and streams when it rains. This problem is compounded by the fact that cattle like to congregate around streams and lakes and seek shade under trees that grow near the edges of water. This means large amounts of manure is deposited at the water's edge or even directly in the water. The manure water then triggers algae outbreaks downstream.

**Cow manure pollutes rivers and lakes**





## The Proposed EPA Rule

EPA’s proposed numeric nutrient rule provides standards for lakes, streams, springs and clear streams, and canals. It also contains nitrogen standards for estuaries consistent with the freshwater standards. Despite the claims made by the rule’s detractors, EPA is not taking a one-size-fits-all approach. Lakes are categorized into three groups (colored, clear & alkaline, clear & acidic) and specific standards are proposed for each group. For streams, EPA is proposing four different watershed-based regions within Florida with different nitrogen and phosphorous criteria for each region. EPA also took into account the need to protect downstream water bodies by proposing equations that would be used to further limit nutrient levels when necessary to protect downstream lakes and estuaries. For springs and clear streams, EPA is proposing a nitrate-nitrite criterion that would prevent nuisance algae. The rule also proposes nitrogen and phosphorus limits for South Florida canals.

In order to allow time for affected polluters to implement the necessary measures to comply with the new rules, EPA is proposing a new water quality regulatory approach called a “restoration standard.” This approach would allow Florida to set incremental water quality stair steps for nutrients that will be stepped down over time to achieve the required ultimate nutrient limit. If a water body does not meet the stair step level for nitrogen or phosphorus at the end of each stair step, the restoration standard would be terminated and the ultimate nitrogen and phosphorus limits would apply immediately. This method would allow polluters the time needed to adjust to the new rule while ensuring that each stair step is complied with.

EPA has also proposed a site-specific criterion which is an alternative water quality standard that protects the lake or stream and is based on sound science but is tailored to a specific site where special natural conditions may exist. These criteria may be more or less stringent than the applicable general nutrient standard and allow for scientific considerations to bring added precision to the necessary nutrient standard at that specific location. This approach would add even more flexibility and make certain that good science is being considered in on-the-ground decision-making.

## The Consent Decree

EPA has proposed the new nutrient standards as a result of a lawsuit by conservationists. Previously, Florida had an unenforceable narrative nutrient standard that said that nutrients couldn’t cause a biological “imbalance.” This was like posting a speed limit sign on I-75 that reads “Drive At A Reasonable Speed Considering Weather, Traffic and Lighting Conditions As Well As Other Relevant Factors.” Numeric standards are like speed limit signs with numbers on them—like “SPEED LIMIT 55 MPH.”



After watching algae outbreaks threaten water bodies across Florida and uncovering EPA documents which stated explicitly that numeric nutrient standards were necessary under the Clean Water Act, Earthjustice sued EPA on behalf of Florida Wildlife Federation, Sierra Club, Conservancy of Southwest Florida, Environmental Confederation of Southwest Florida, and St. Johns Riverkeeper. The suit sought to require EPA to promptly set numeric standards. The Florida Department of Agriculture, the South Florida Water Management District, the Phosphate Mining and Sewage Utilities Councils, and many associations of farming and industrial polluters intervened in opposition to the establishment of numeric limits.

After extensive negotiations, EPA entered into a settlement agreement with the conservationists. Finding that sewage, fertilizer, and animal waste pollution have worsened or not been reduced from unacceptably high levels, the federal court found that Florida's narrative standards had not solved the problem. Thus the federal court entered a Consent Decree, meaning that it approved the settlement as fair, reasonable and in the public interest. The Consent Decree requires EPA to finalize numeric standards for lakes and streams by October 2010 and to finalize standards for estuaries a year later. The court's order forecloses the argument that EPA can abandon or postpone setting enforceable numeric standards for Florida.

Summary Table – EPA Proposed Rule Compared to DEP Proposal<sup>1</sup>

Lake class	EPA Proposed Criteria			Florida Proposed Criteria		
	Chl a <sup>2</sup> , µg/L <sup>3</sup>	Nitrogen <sup>4</sup> mg/L <sup>5</sup>	Phosphorus <sup>6</sup> mg/L	Chl a, µg/L	Nitrogen mg/L	Phosphorus mg/L
Colored Lakes	20	1.23-2.25	0.050-0.157	20	1.23-2.25	0.05-0.157
Clear Lakes (Alkaline)	20	1.00-1.81	0.030-0.087	20	1.00-1.81	0.03-0.087
Clear Lakes, (Acidic)	6	0.50-0.90	0.010-0.030	9	0.85-1.14	0.015-0.043
South Florida Canals	Chl a, µg/L	Nitrogen mg/L	Phosphorus mg/L			
	4	1.6	0.042			

EPA Nutrient Watershed Regions	EPA Proposed Instream Criteria		Florida Nutrient Watershed Regions	Florida Proposed Instream Criteria	
	Nitrogen mg/L	Phosphorus mg/L		Nitrogen mg/L	Phosphorus mg/L
Panhandle	0.824	0.043	Panhandle	0.820	0.069
Bone Valley	1.798	0.739	Bone Valley	1.730	0.415
Peninsula	1.205	0.107	Peninsula	.....	0.116
North Central	1.479	0.359	North Central	.....	0.322
			Northeast	.....	0.101

Nitrogen limits for estuaries correspond to tributary concentrations.  
Phosphorus limits for estuaries to be determined.

<sup>1</sup> These criteria were proposed for adoption by the Florida DEP in the fall of 2008.

<sup>2</sup> Chlorophyll a (herein "Chl a")

<sup>3</sup> micrograms per liter (herein "µg/L")

<sup>4</sup> Total Nitrogen (herein "Nitrogen")

<sup>5</sup> milligrams per liter (herein "mg/L")

<sup>6</sup> Total Phosphorus (herein "Phosphorus")



**Polluter Associations claim that compliance with the EPA rule would cost as much as \$100 billion. That's enough money to buy a gold-plated toilet for every house and mobile home in Florida.**

## Practical Solutions

**Smart Lawns.** Floridians love to keep beautiful yards, but applying too much fertilizer means that huge amounts of fertilizer are washed into streams, lakes and estuaries every time it rains. Runoff from fertilizer in residential areas causes a third of the problem. In most of Florida, no fertilizer at all is needed to have a beautiful lawn. What's worse, three-fourths of it washes off when it rains, meaning that most of it is wasted. That's why several counties and cities in Florida have adopted Smart Fertilizer ordinances that ban lawn fertilizer during the summer rainy season. These ordinances also encourage planting of native trees and shrubs that need no fertilizer. Home owners save money and don't have to pay local government taxes

for new expensive water treatment systems for stormwater polluted by fertilizer. While a pound of nitrogen fertilizer costs only about \$5, the cost of a water clean up project for nitrogen pollution is \$225 per pound of nitrogen. Smart Fertilizer rules save everybody money.

**Smart Farms.** Cleaning up polluted waterways can be expensive, so the best way to treat nutrient pollution is to eliminate it at its source. This means being smarter about how we use fertilizer on our farms. The only fertilizer that runs into lakes and rivers is fertilizer that's wasted. Properly applied, it is supposed to be used by the plants. All that fertilizer runoff wastes money too. Instead of this waste, farms need to implement smart fertilizer practices. These include: 1) controlling runoff on farms; 2) performing scientific soil testing – down to where the roots actually reach - to determine the actual needs of crops; 3) applying fertilizer only to the root zone of the plants; and 4) applying fertilizer only in the amount needed by the plant. If we required fertilizer to be used more carefully on our farms, we could go a long way toward protecting our waters without wasting money on unnecessary fertilizer or costly restoration projects.

**Better Sewage Treatment.** The claim that it will take over \$50 billion to upgrade our sewage treatment plants to comply with the new rule is claptrap. Upgrading all the sewage treatment plants in the entire United States (including federal grants, state contributions, and leveraged bonds) from 1988 to 2007 only cost \$58 billion. The \$50 billion claim is based on treatment by reverse osmosis – the method Saudi Arabia uses to convert sea water to fresh water. Some wastewater treatment plants will have to spend serious money to clean up their act. That's because these plants are now allowed to dump effluent that hasn't been filtered and treated very well.

**Fertilizer ordinances save people money**

### Soil testing avoids wasting fertilizer

Some have no permit limits on their phosphorus and nitrogen discharges at all. Others with spray fields in North and Central Florida will need much better treatment for nutrients because of underground connections to springs and rivers. But most plants in Florida would only need add-ons that use chemical treatment or biological uptake systems. Extremely low levels can be attained with these processes. For most of these, capital cost would be about \$1.50 to \$2.00 per gallon capacity with a few cents per gallon per month in operating and maintenance costs. The new standards will also be phased in as permits come up for renewal. So instead of the scary numbers opponents to the rule throw around, it is more likely to cost a few dollars extra per person per month phased in over several years, and it is likely that there would be state and federal money to help out with these costs. The alternative of not establishing protective numeric standards for our streams, lakes and estuaries will only make the problems worse and the cleanup more expensive.



**Better Manure Management.** Some dairy operations have thousands of cows that each generate 140 pounds of manure per day. These massive amounts of manure should be disposed of responsibly. Manure - including wash water from barn floors - should be dried and recycled as fertilizer or disposed of in land fills. Otherwise, manure moves through ground and surface water to contaminate springs and downstream waters. A major source of cow manure is from cow calf operations where manure washes into rivers and streams. The water management districts and the state Department of Environmental Protection should require cow calf operations to fence cows out of streams and rivers

**Better sewage treatment costs about \$10 per family per month**

and require the construction of shade structures such as pole barns. Cows eat in the open pastures and then congregate in the shady areas near water as they digest grass. Large amounts of manure accumulate in these areas. The construction of shade roofs provides the cows with shade away from the water and concentrates manure in a place where it can be removed with a tractor. Controlling manure at the source saves taxpayers money in the long term by avoiding clean-up costs and the cost of multibillion dollar pollution treatment projects.



**Cows will congregate under shade barns away from rivers**

# Editorials

## **St. Petersburg Times: Toward Clean Water**

Nov. 23, 2009

“The state has sat on its hands for 11 years while runoff from farms, sewer plants, golf courses and homes has put the environment, public health and the tourist economy at risk...Public waterways should not be dumping grounds for industrial waste. Clean water has a cost - but so do polluted springs, closed beaches, toxic rivers and tainted drinking water supplies...The nutrient limits should help reduce pollution in the short term and force regulators and manufacturers to rethink how Florida farms, builds and disposes of its sewage and industrial waste.”

## **Miami Herald: New EPA water rules worth every penny**

Jan. 20, 2010

“Despite the opposition of a coalition of agriculture and business groups, state residents should support the EPA's proposals. It's in the interests of every Floridian to have healthy estuaries, rivers, lakes, streams and canals, which not only are used for recreation but also supply some communities' drinking water. Polluted streams and rivers can contaminate offshore fish hatcheries, too, threatening commercial and recreational fishing industries.”

## **The Tampa Tribune: Clean Water Won't Hurt Economy**

Dec. 3, 2009

“This widespread contamination is a far bigger threat to Florida's economy than water-quality rules. And the feds would not have gotten involved if the state had addressed the situation.”

## **Florida Times-Union: Nutrient Limits For St. Johns River Are Essential To Its Health**

Nov. 17, 2009

“...the EPA action will help protect our greatest natural resource, the St. Johns River, and finally force polluters to clean up their acts instead of treating the river as a sewer.” – Ron Littlepage

## **TC Palm: Thumbs up: Government to set standards for assuring clean water**

Nov. 20, 2009

“The Treasure Coast has experienced the results of pollution from urban and agricultural runoff for many years. With scientific restrictions on pollution, perhaps an end is in sight and the clean water, which should be a right for the citizens of this region and state, will become reality.”

## **Florida Today: Clean Water Victory; Court Ruling Big Step In Protecting Florida, Brevard County Waters**

Nov. 22, 2009

“Opponents will likely continue fighting the new rules, but the Obama administration and courts should stand fast and protect Florida's waters.”

## **Daytona Beach News Journal: Nutrient overload: Cleaning polluted surface waters no 'burden' to Florida**

Dec. 8, 2009

“In a state much favored with surface water, citizens shouldn't have to sue their government to assure those waters run clean. Florida's commerce can prosper without destroying its springs, lakes, rivers and estuaries. That is the point of the federal (Clean Water) Act. It should be the result of strict EPA standards and welcome compliance by Florida's business and agricultural community.”

## **The Gainesville Sun: Can't afford it?**

Jan. 20, 2010

“... The notion that Floridians simply can't afford clean water is spurious on its face.”