Collier Soil and Water Conservation District

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Clean Water Act

When Congress adopted the Clean Water Act in 1972, it was to prevent pollution and protect clean water--relying on a careful balance between state and federal responsibility and public participation.

Algal blooms may occur in freshwater as well as marine environments.

Typically only one or a few phytoplankton species are involved and some blooms may be recognized by discoloration of the water resulting from the high density of pigmented cells.

Although there is no officially recognized threshold level, algae can be considered to be blooming at concentrations of hundreds to thousands of cells per milliliter, depending on the causative species.

Algal bloom concentrations may reach millions of cells per milliliter.

Colors observed are green, yellowish-brown, or red.

As more algae and plants grow, others die.

The EPA's Total Maximum Daily Load Program (TMDL)

With all of the "job-killing regulations" rhetoric floating around these days, it's easy to forget that it is the responsibility of federal agencies like the US Environmental Protection Agency (EPA) to protect the public, ensuring that we have clean air to breathe and safe water to drink.

Safeguards put in place to protect us often have compliance costs, but time and again their benefits have been shown to outweigh these costs. In fact, a study by the Office of Management and Budget shows that between 2000 and 2010, the benefits of major regulations far exceeded the costs—More information is at: http://tinyurl.com/6smsug8

Impaired Waters

Section 303(d) of the Clean Water Act establishes a process for states to identify waters within its boundaries where implementing technology-based controls are inadequate to achieve water quality standards. States establish a priority ranking of these waters and, for priority waters, develop total maximum daily loads.

A TMDL identifies the amount of a specific pollutant or property of a pollutant, from point, nonpoint, and natural background sources, including a margin of safety, that may be discharged to a waterbody and still ensure that the water body attains water quality standards.

The allocations of pollutant loadings to point sources are called wasteload allocations. Effluent limits in National Pollutant Discharge Elimination System permits must be consistent with such wasteload allocations. Also, in the absence of a TMDL, permitting authorities still must assess the need for effluent limits based on water quality standards and, where necessary, develop appropriate wasteload allocations and effluent limits. This analysis could be done for an entire watershed or separately for each individual discharge.

According to the Florida Department of Environmental Protection's list of impaired waters, about 1,918 miles of rivers and streams are currently impaired for nutrients. The number of miles grew from approximately 1,000 miles in 2008 to approximately 1,900 miles in 2010. Impaired acres of lakes increased from 350,000 acres in 2008 to 378,000 in 2010.

The EPA was sued by the Florida Wildlife Federation which argued that EPA had an obligation to promulgate the standards itself until the State acted. EPA evaluated the situation in Florida and found that the number of waters impaired by nutrient pollution was growing and the State's narrative standards for water quality—verbal descriptions of clean water conditions—did not provide an adequate basis to effectively address the scope and magnitude of the problem. In early 2009, EPA determined numeric limits of nitrogen and phosphorus pollution were necessary, whether issued by the state or EPA.

Bright green blooms may also occur. These are a result of blue-green algae, which are actually bacteria (cyanobacteria).

Some algal blooms are the result of an excess of nutrients (particularly phosphorus and nitrogen) in waters and higher concentrations of these nutrients in water cause increased growth of algae and green plants.

This dead organic matter becomes food for bacteria that decompose it.

With more food available, the bacteria increase in number and use up the dissolved oxygen in the water.

When the dissolved oxygen content decreases, many fish and aquatic insects cannot survive.

This results in a dead area. Algal blooms may also be of concern as some species of algae produce neurotoxins.

At the high cell concentrations reached during some blooms, these toxins may have severe biological impacts on wildlife.

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Florida's environmental degradation can only be reversed from the bottom-up, e.g., personal efforts, civic association initiatives, community group actions, local organization programs, etc., dedicated to improving our habitat. Here's the problem we must come to grips with:

Collier County Impaired Waterbodies (Cycle 2006)

ID #	WBID	Waterbody Name	# of Impairments
11	**FL-3259A**	Cocohatchee River	3- Biochemical Oxygen Demand (BOD); Coliforms, and Dissolved Oxygen
12	**FL-3259B**	Cocahatchee River Canal	2- Dissolved Oxygen; Iron
13	**FL-3259C**	Gordon River	3- Biochemical Oxygen Demand (BOD); Coliforms, and Dissolved Oxygen
14	**FL-3259D**	Gordon River Canal	1- Dissolved Oxygen
15	**FL-3259E**	Henderson Creek Canal	1- Dissolved Oxygen
16	**FL-3259F**	Golden Gate Canal	1- Dissolved Oxygen
17	**FL-3259G**	Naples Bay	1- Nutrients
18	**FL-3259H**	Henderson Creek Canal	1- Dissolved Oxygen
19	**FL-3259L**	Blackwater River	1- Dissolved Oxygen
20	**FL-3259M**	Runoff to Gulf	1- Fecal Coliform
21	**FL-3259W**	Lake Trafford	1- Dissolved Oxygen
22	**FL-3261B**	Tamiami Canal	3- Cadmium; Dissolved Oxygen, and Mercury
23	**FL-3261C**	Barron River Canal (North)	1- Dissolved Oxygen

What is "Normal" for Dissolved Oxygen (DO)?
DO levels that are at a 90% saturation level or higher consistently are considered healthy, unless the water has become supersaturated because of cultural eutrophication. If the DO values in rivers are below 90%, there may be large amounts of oxygen demanding materials. Many factors contribute to how high or low a DO level may be. Water temperature is one of the causes. Oxygen and other gases dissolve more easily in cooler water than in warmer water. Certain factors affect the water temperature. These factors are seasons of the year, time of day, and water depth. By affecting temperature, factors affect DO. Levels of DO fluctuate from morning to night. DO is highest just before dark because the plants have photosynthesized all day. At night, levels drop because the plants aren't photosynthesizing and are conducting respiration.

Eutrophication is an increase in nutrients that can lead to an overgrowth of algae. The overgrowth doesn't allow the plants to photosynthesize. If the plants don't photosynthesize, the levels of oxygen decrease possibly causing oxygen sensitive organisms to die.

What Causes Low DO?
If biochemical oxygen demand is too high, the DO content of the water becomes depleted, and the DO content of the water becomes too low to support all the life in the water. If a body of water has large amounts of decaying vegetation, like leaves or aquatic microorganisms, then the amount of DO is reduced.

Sometimes people dump raw sewage, garbage, grass and other decayable substances in the water. As these things decay, the amount of DO falls. When bacteria decompose food, leaves, and feces, they require a great amount of oxygen, lowering the DO level. Urban and agricultural runoff, such as fertilizers, makes algae grow. The algae block the sunlight from the other plants, and the plants die so bacteria again decompose this organic matter, lowering DO.

Wake up; this is what numeric nutrient criteria is all about.