Threats to Florida's Water Quality

Introduction

Water is the single-most important substance on Earth for the survival of living organisms. Life on Earth is mostly composed of water and therefore the quality of that water is critical. In Florida, we are surrounded by water, using it to drink, bathe, cook, garden, recreate, irrigate, fill our swimming pools and the list goes on. Florida's waterways have been altered by development and agriculture for as long as humans have been settled here. With increasing populations and density, increasing built-up areas and increasing demand for agricultural crops, our waterways have been impacted. Many of these waterways are now classified as impaired; that is to say these bodies of water cannot provide for one or more of its intended uses (drinking, irrigation, industry, etc.). Water bodies may become impaired for a variety of reason. Most commonly this is the presence of one or more pollutants, including toxins and nutrients, or a change in temperature or sediment. Any imbalance in a natural system has the potential for catastrophic effects.

General Information: Water Quality

Rivers and streams tend to be less polluted than lakes and estuaries because water is constantly moving in these systems. It is where the rivers and streams deposit their water (and pollutants) that we begin to see problems. Tampa Bay is Florida's largest estuary (where rivers and streams meet salt water). Estuaries are the nurseries for marine fishes and other organisms crucial to the environmental, economic and social health of our area. The economic and social component of tourism would not exist without the draw of beautiful beaches and enticing fishing industry. Thus the connection between water quality and peoples' quality of life is a strong one which must be protected.

Watersheds like the one protected by the Brooker Creek Preserve in Tarpons Springs, FL provide drinking water for millions.

Top Three Threats to Water Quality

These have been identified as: sediments (dirt), nutrients and bacteria.

Sediments are usually washed into rivers and streams when the area around those water bodies is cleared (due to human activity such as agriculture, roadwork and construction). This is called runoff. Although sediments are naturally occurring substances, when they move out of place because of human activity, problems can arise. As sediments wash into a nearby lake or stream, the water can become murky, shading out oxygen-producing plants and therefore causing problems for the entire system. Sediments can also choke invertebrates and fishes and affect the reproduction of many living things in the water.

Nutrient pollution is the most serious form of impairment in Florida. Nutrients may sound like something a system would need to survive, but an imbalance of nutrients can cause some organisms to thrive at the expense of others. Runaway growth of certain organisms (such as algae) due to high levels of nutrients results in those organisms (the algae) using up available

oxygen, leading to potential suffocation of other organisms. Where do these nutrients usually come from? Agricultural fertilizer runoff is usually the primary suspect; but the use of fertilizer in home landscapes results in more of this type of pollution. In addition to fertilizer, nutrients from dog feces not collected by the owner can cause water bodies to become impaired.

We know bacteria can make people sick, but the presence of harmful bacteria in an ecosystem (were it is not naturally found) can also have negative effects on the health of organisms (including humans) in the water. The growth of blue-green algae (a type of bacteria) can be accelerated by heavy rain, causing nutrient runoff into estuaries. Some of these bacteria can make humans sick and cause the death of dolphins, manatees, birds and fish.

Specific Information: Measuring Water Quality

How can you tell if a water body is impaired? It may look impaired if the water is brown or green, but water color is not always a reliable test. To really measure water quality, a series of tests are regularly performed by various monitoring agencies. These tests include complex chemical and biological analyses and water clarity tests. Some tests can be done quickly in the field to get an idea of the health of a water body, while others might need to be processed in a specialized laboratory. The following are examples of field tests:

Dissolved Oxygen (DO): This chemical test can measure how much oxygen is available for aquatic organisms. Oxygen enters the water through production by photosynthetic plants and microorganisms, and some oxygen gets into the system through wind or flowing water. Fish and other organisms consume this oxygen, so a healthy system needs plenty of DO. The presence of unnaturally large populations of oxygen consumers (like bacteria) can reduce the amount of DO available to others, producing low DO results. This can lead to fish kills and aquatic plant death.

pH (acidity): pH may be familiar to you, as the scale of acidity to alkalinity or acid to base. Low pH indicates an acidic state, while a more basic state is represented by a higher pH value. The scale goes from 1 (extremely acidic) to 14 (extremely basic). As you would expect, most living organisms prefer an environment in the middle or neutral zone of the pH scale. Most natural water systems are in the 6.5 – 8.5 range and the organisms in those waters are adapted to some natural fluctuations. If a system becomes suddenly too acidic or basic, life in those waters may suffer, or other organisms may move in and disrupt the balance. Industrial pollutants can cause acidification or alkalization of a water body among other problems.

Turbidity (NTU): This is the amount of scattered light in a water body due to the presence of suspended particles of sediment. As mentioned earlier, a system with added sediment may look cloudy due to these suspended particles. Another cause of cloudy water may be the presence of an algal bloom, with millions of extra organisms in the water, themselves becoming the suspended particles. No matter the cause of clouded water, the outcome is limited sunlight for the other organisms in the water. This can lead to a decrease in DO and impaired system.

What You Can Do

A watershed is an area of land in which all of the water that enters it drains to a common water body. Florida has 29 large-scale watersheds. You can take steps to protect the water quality in your watershed. Any of the previously-mentioned pollutants that run off your property will flow into your local watershed. Therefore it is important to take simple measures to prevent this from happening. Try these easy steps:

1) **Use fertilizers and pesticides as suggested on the label** or eliminate use of these substances by trying natural alternatives such as compost. The nutrients (fertilizer) and toxins (pesticides) applied to your yard can wash away during a rain event and end up in a nearby water system. It is especially important to keep these substances from spilling onto the sidewalk or street because water entering a stormdrain is not treated before it reaches the water body it drains to. A good alternative is to use native plants in the landscape that do not require supplemental fertilization.

2) Reduce the amount of rainwater that washes away from your property. Some ways to prevent runoff are collecting rainwater via rain barrels or cisterns and replacing impervious surfaces (concrete patios, driveways) with permeable alternatives such as pervious pavers. Preventing this runoff from your property keeps water available for your plants' use and helps prevent soil and nutrients from washing downstream. Keeping rainwater from running off into storm drains also helps re-charge underground water sources.

3) Scoop the Poop! Always collect your pet's waste and dispose of it in a sealed plastic bag. Pet waste accounts for a surprising amount of nutrient "poo-lution" in Florida. This may be a source of bacterial contamination as well.

4) Keep yard waste out of the street. Many landscapers and homeowners may sweep or blow yard clippings and leaves into the street. This goes against landscape "best management practices" and allows nutrient pollution to enter the waterways via the storm drains. Remember: everything that goes down the storm drain goes directly to the nearest body of water; it is not treated in any way.

For more information on watershed health please visit:

Southwest Florida Water Management District (SWFWMD) - WaterMatters.org

Water Atlas - http://www.wateratlas.usf.edu/

Florida Friendly Landscaping-
http://www.floridayards.org/

Your Local Extension Office
http://solutionsforyourlife.ufl.edu/map/

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