

Nutrients: Too Much of a Good Thing

Water pollution degrades surface waters making it unsafe for swimming, drinking, fishing, and other activities. As authorized by the Clean Water Act (CWA), the National Pollutant Discharge Elimination System (NPDES) Permit Program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances, such as man-made ditches or pipes as shown in the picture above. Goddard maintains an NPDES industrial permit for effluent discharges to waters of the State.



Excess nutrients can be a huge problem

Pollution prevention and control measures are critical to improving water quality and reducing the need for costly drinking water and wastewater treatment. Excessive nutrients, such as nitrogen and phosphorus, cause major degradation of water quality in the Chesapeake Bay watershed. Nutrients are a critical component to a healthy ecosystem, but too much of a good thing can be

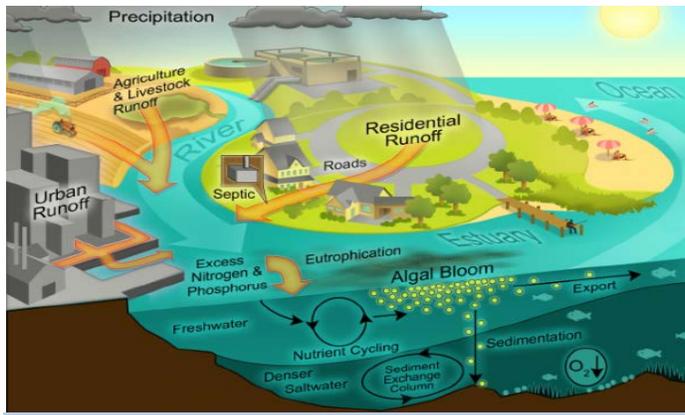


catastrophic when it comes to our waters. Nutrient pollution fuels the overgrowth of algae, which blocks sunlight from reaching aquatic vegetation beneath the surface. This overgrowth leads to the demise of beneficial plants and robs the water of oxygen that aquatic animals need to survive.



Where is it all coming from?

You may be wondering where all these excess nutrients come from. There are many sources, but wastewater treatment plants contribute the majority of nutrients that enter the Bay through specific, identifiable point sources. Wastewater plants release treated water, which may still contain large amounts of nutrients. Non-point sources, such as air pollution from vehicles, industries, gas-powered lawn equipment, and other emitting sources contribute nearly one-third of the total nitrogen load to the Chesapeake's waterways. Nutrients also come from fertilizers that run off during rain events. Fertilizers are still widely used on



<http://www.wri.org/project/eutrophication/about/sources>

deposition into coastal waters.

farmland, and on urban and suburban lawns. (See *A Homeowner's Guide to Lawn Care* available on the environmental outreach website listed below.) Car-pooling to work or using eco-friendly fertilizers can help reduce the amount of excess nutrients. The picture to the left shows different pathways of nutrient

Bay restoration efforts

There are many Bay restoration efforts currently underway. One of the most aggressive and holistic efforts was established in December 2010. This effort is the Chesapeake Bay TMDL (Total Maximum Daily Load), which was initiated at the federal level to cover actions across six states and the District of Columbia. The Bay TMDL is an ongoing effort to identify land use practices that affect the region and create management practices to reduce pollutants. This is the first effort that effectively addresses both point sources and non-point sources of pollution, such as land use and atmospheric deposition. Nutrient monitoring requirements, such as those required by GSFC's NPDES permit, was the first of many efforts established by the State in this restoration effort.

Visit the websites below for more information on Excess Nutrients.

<http://www.epa.gov/chesapeakebaytmdl/>

http://www.chesapeakebay.net/indicators/indicator/reducing_nitrogen_pollution

<http://www.fws.gov/nc-es/edout/albenutrient.html>

Also, check out the some of our past environmental bulletins on this and similar topics:

<http://code250.gsfc.nasa.gov/environmental/outreach.cfm>

