NUTRIENTS:

Too Much of a Good Thing

Nutrients 101

What are nutrients?

Nutrients are chemical compounds that all living things need to grow. When organisms take in too many nutrients, they shed the excess nutrients in their waste. Two common nutrients are nitrates and phosphates.

❑ GOT IT!

How do these nutrients affect the Chesapeake Bay?

Nutrients play an important role in a balanced ecosystem. But too many can throw the ecosystem out of balance and cause problems. Excess nutrients can come from sources including fertilizer and vehicle exhaust. When it rains, stormwater running off hard surfaces carries the excess nutrients to local waterways. The runoff that flows into local streams and rivers ultimately ends up in the Chesapeake Bay. Excess nitrates and phosphates cause phytoplankton called algae to grow rapidly until they become what's called an algae bloom. Algae blooms block the sun from reaching the bottom of the Bay, reducing the growth of underwater grasses. Without sunlight, the grasses die and the entire aquatic ecosystem is disrupted. In addition, bacteria and other decomposers consume the algae and with it reduce the dissolved oxygen in the water. The result is a dead zone with little to no dissolved oxygen to support life.

❑ GOT IT!

DIVE DEEPER:

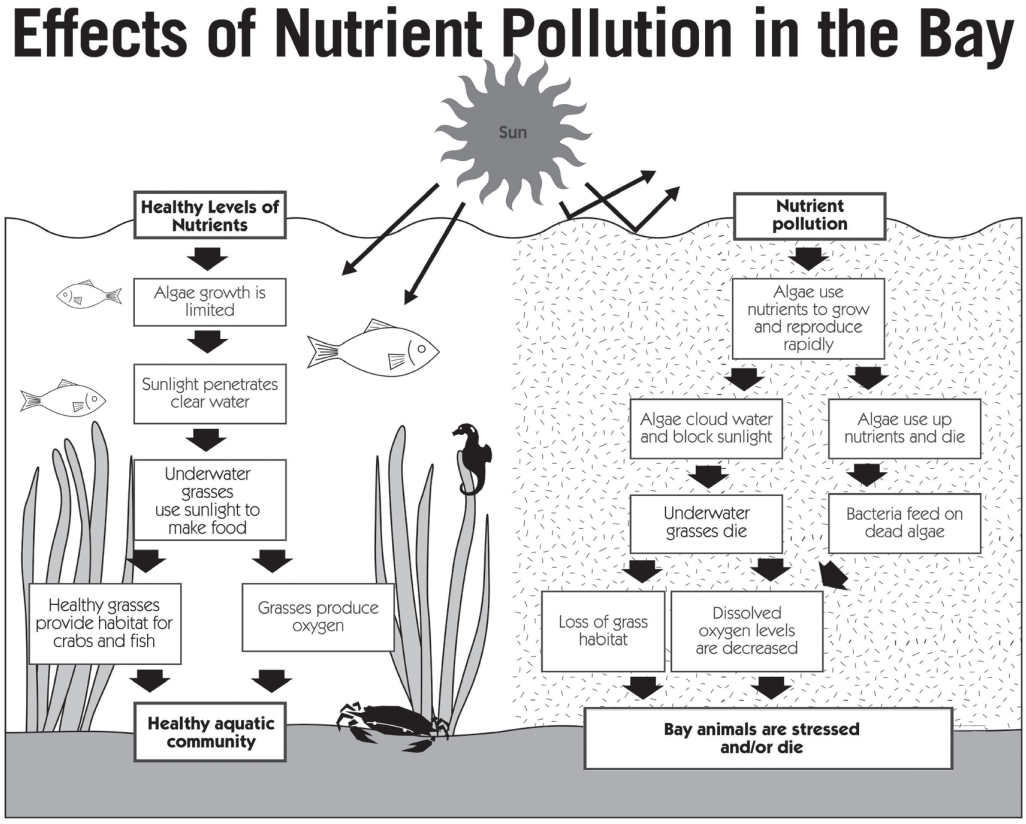
Visit CBF's website to learn more about polluted runoff.

cbf.org/issues/polluted-runoff/

Investigate

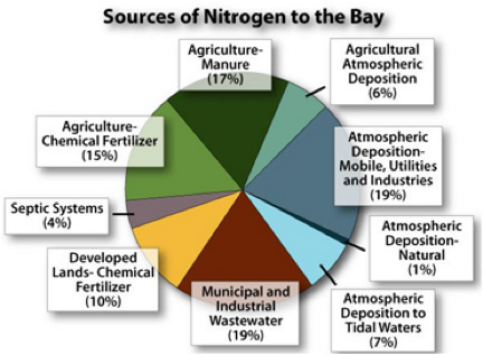
1. How does your neighborhood contribute to water quality in the Chesapeake Bay? What affects nitrogen levels in the water?

2. Look at the graphic below. Are excess nutrients good or bad for the Bay? Explain.



A Closer Look at One Nutrient: Nitrates

Look at the chart below from the U.S. Chesapeake Bay Program and answer the questions that follow.



3. What percentage of nitrogen in the Bay comes from agricultural sources?

4. How much nitrogen comes from wastewater, including septic systems?

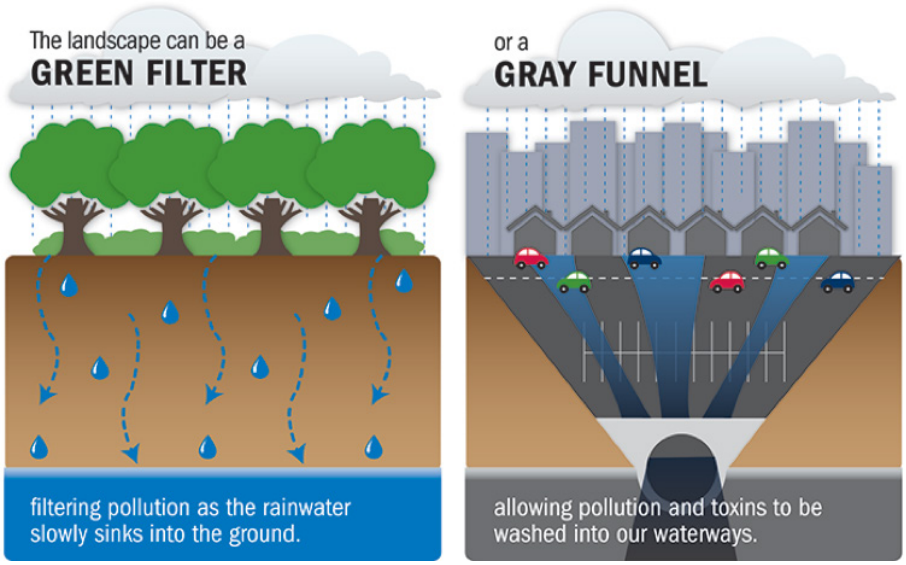
Atmospheric deposition is the process by which precipitation like rain or snow deposits particles from polluted air in the atmosphere back onto the Earth's surface. This means that every time a coal-fired power plant burns coal or a car engine burns gasoline, the air pollution from burning these fossil fuels can end up polluting the land and water as well, through atmospheric deposition.

5. What percentage of nitrogen in the Bay comes from all atmospheric deposition?

Reducing Nutrient Pollution

One of the best ways to reduce nutrient pollution in the Bay is by using land in ways that act as a green filter instead of a gray funnel. A gray funnel is a hard surface that does not absorb nutrients. All nutrients, including those from atmospheric deposition, that run off surfaces like roads, rooftops, and sidewalks become water pollution. A green filter is usually a natural space with trees and tall grasses, like a rain garden or a forested buffer. Leaves, roots, healthy soil, and biological processes absorb stormwater runoff. This filtering action helps slow down and soak up the polluted water before it runs off into local waterways.

Most of the land in your neighborhood is somewhere between a green filter and a gray funnel. For example, you may see roofs and roads, but you may also see trees and grass. Think of the area where you live as a balance of green and gray and look for ways to make the gray a little greener and make the green areas a better filter. For example, we need roads and roofs in every community. But we can make them less of a gray funnel by adding street trees and green roofs to the area.



Scavenger Hunt

Go outside or look outside and answer the following questions.

6. List at least three "green filters" you can see.

1.

2.

3.

7. List at least three "gray funnels" you can see.

1.

2.

3.

8. Do you see more green filters or gray funnels?

9. Describe at least three places you can see that could be more of a green filter. How would you change those spaces to make them greener? For example, do you see a place with short grass that could become a tall wildflower patch? Or a place that is paved unnecessarily? Or an area of bare dirt that could be planted with trees or shrubs?

10. How would creating these green filters make a difference in your neighborhood?