Sowing the Seeds for Healthy Waterways:

How Your Gardening Choices Can Have a Positive Impact in Your Watershed

EPA-820-C-08-001
June 2008

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If we lived in a perfect world…

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Form 1040 (2007)

Tax and Credits

	38	Amount from line 37 (adjusted gross income)
	39a	Check if: ☐ **You** were born before January 2 ☐ **Spouse** was born before January
Standard Deduction for—	b	If your spouse itemizes on a separate return or you were a
	40	**Itemized deductions** (from Schedule A) **or** yo
	41	Subtract line 40 from line 38
	42	If line 38 is $117,300 or less, multiply $3,400 by 6d. If line 38 is over $117,300, see the worksheet
	43	**Taxable income.** Subtract line 42 from line 41
	44	**Tax** (see page 33). Check if any tax is from: **a** ☐ Fo
	45	**Alternative minimum tax** (see page 36). Attac
	46	Add lines 44 and 45
	47	Credit for child and dependent care expenses. At
	48	Credit for the elderly or the disabled. Attach S
	49	Education credits. Attach Form 8863
	50	Residential energy credits. Attach Form 5695
	51	Foreign tax credit. Attach Form 1116 if require
	52	Child tax credit (see page 39). Attach Form 8
	53	Retirement savings contributions credit. Attach Form 8880
	54	Credits from: **a** ☐ Form 8396 **b** ☐ Form 8859 **c** ☐ Form
	55	Other credits: **a** ☐ **Award-winning rose garden** **b** ☐ Form 3800 **c** ☐ Form 8801 **d** ☐ Form
	56	Add lines 47 through 55. These are your **total credits**
	57	Subtract line 56 from line 46. If line 56 is more than line 46, enter -0-

- People who checked any box on line 39a or 39b **or** who can be claimed as a dependent, see page 31.
- All others:

Single or Married filing separately, $5,350

Married filing jointly or Qualifying widow(er), $10,700

Head of household, $7,850

Other Taxes

	58	Self-employment tax. Attach Schedule SE
	59	Unreported social security and Medicare tax from: **a** ☐ Form 4137 **b** ☐ Form 8919
	60	Additional tax on IRAs, other qualified retirement plans, etc. Attach Form 5329 if required

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Nitrogen and Phosphorus pollution, also known as "Nutrient Pollution"

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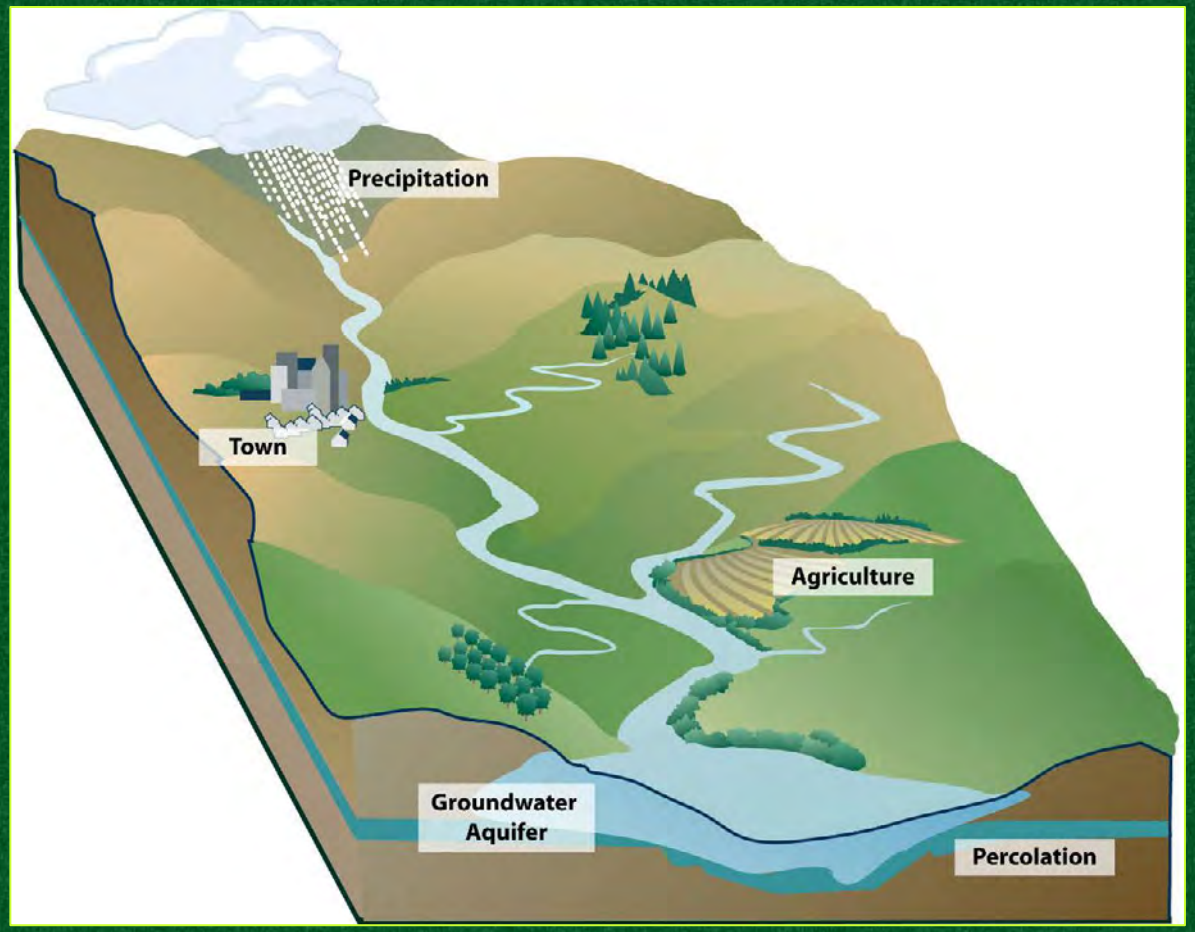
Watershed

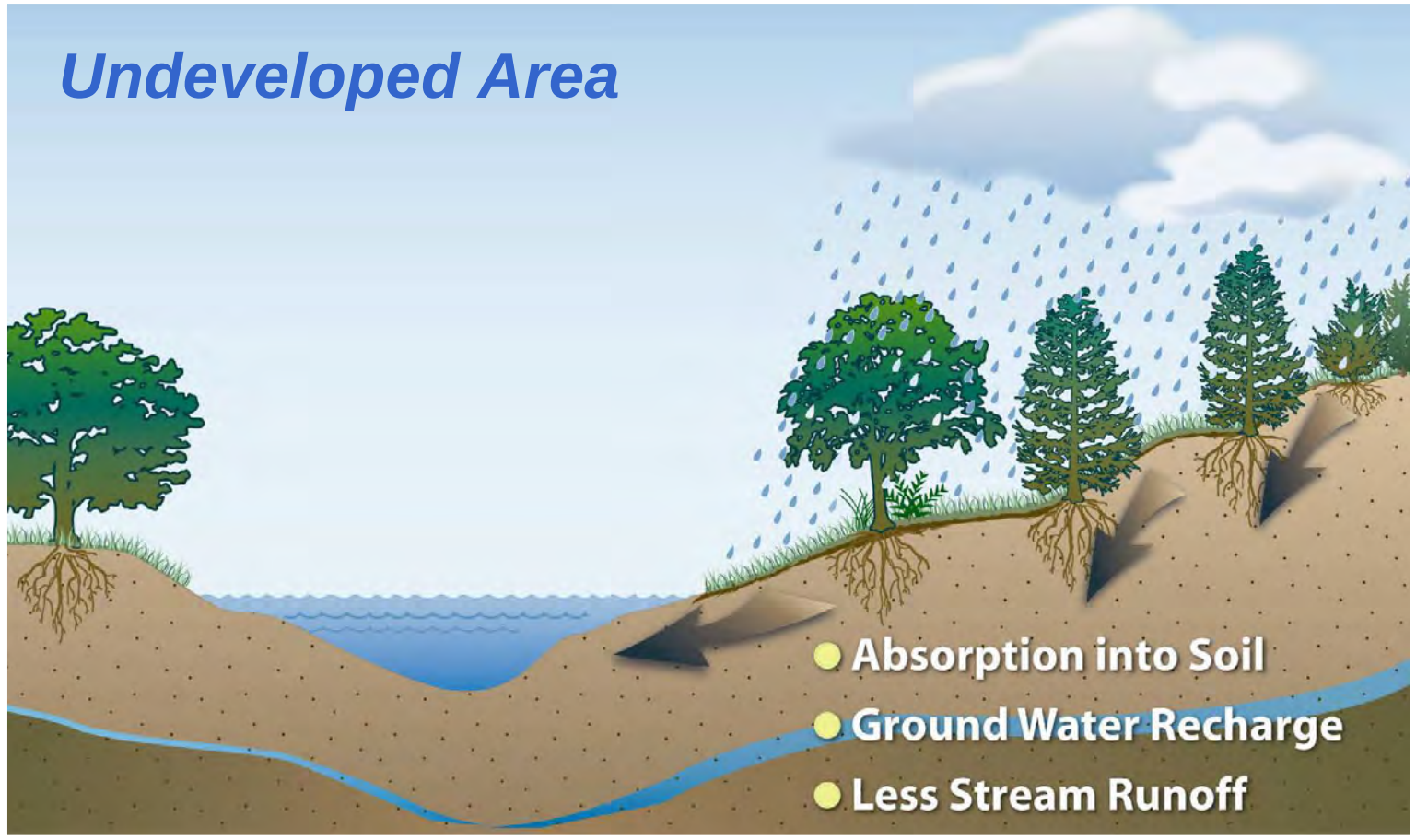
- A watershed is an area of land where all the water drains into a common body of water. Watersheds are also referred to as “drainage basins.”



The path water takes as it flows downhill impacts water quality.

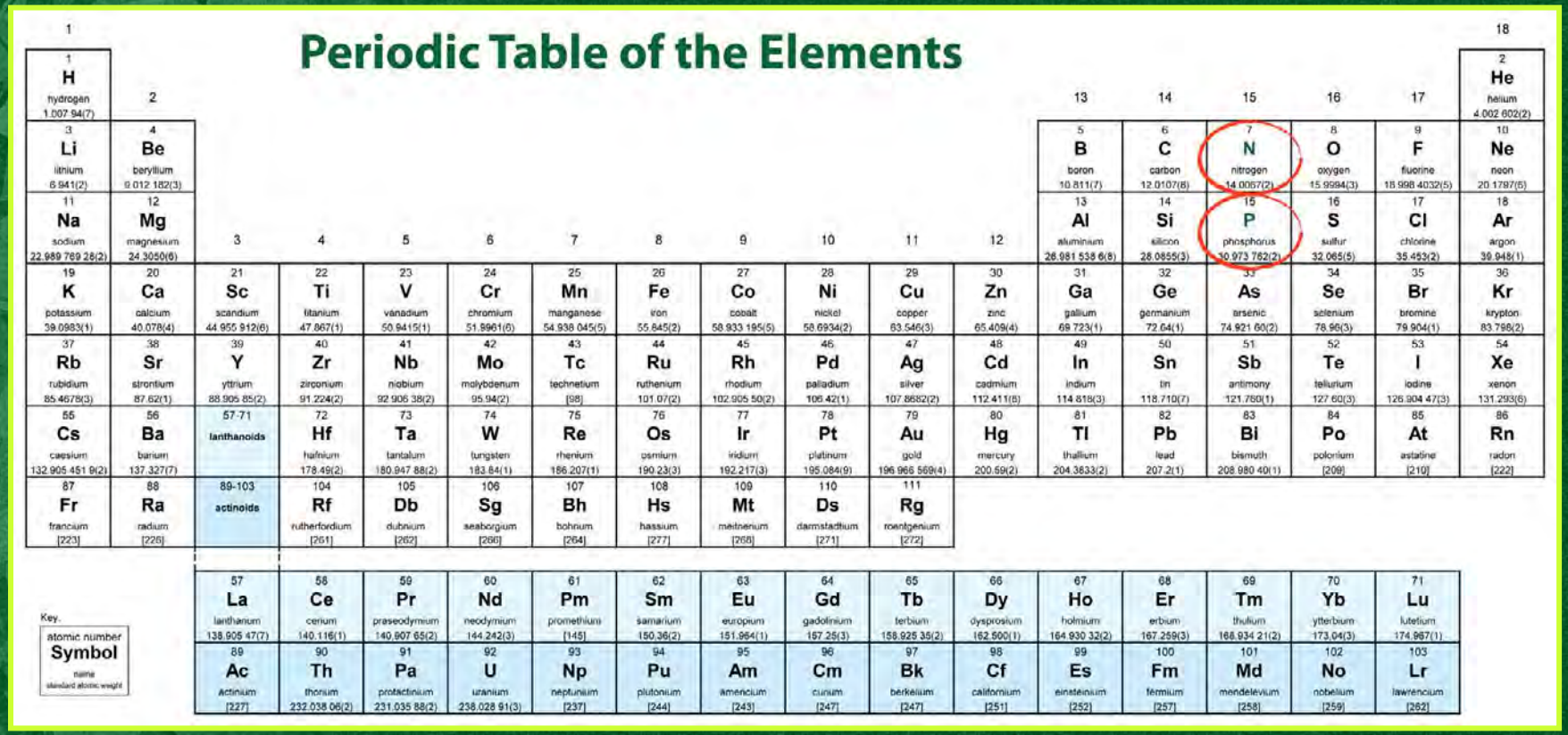
Water runs off the land, carrying fertilizer, dirt, pet waste and many other pollutants with it directly into the waterway.

The path water takes as it flows downhill impacts water quality.



Water percolates through the ground slowly.

Nitrogen and Phosphorus 101



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What are Nutrients?

- Nutrients are elements, like nitrogen and phosphorus, that occur naturally in water, soil and air
- Sources of nutrients
  - Decaying plant matter
  - Animal and human wastes (pet waste, septic tanks, waste water treatment plants)
  - Detergents
  - Fertilizer (residential, commercial, and agricultural)

Nitrogen

- Highly soluble in its common compound form, nitrate.
- Easily washed from the soil by rain or irrigation.
- Leached from the soil or absorbed by plants within weeks of application.
- Stimulates shoot growth in plants.
- Signs of deficiency can mimic other plant illnesses; yellowing leaves (with or without a reduction in size).

Phosphorus

- Typically found in soil as an insoluble compound.
- Leaches from the soil very slowly.
- Deficiency appears first as slowed growth. The leaves will become dull and dark green or grayish green.

Nutrients are similar to chocolate – a little is good, but too much is a bad thing

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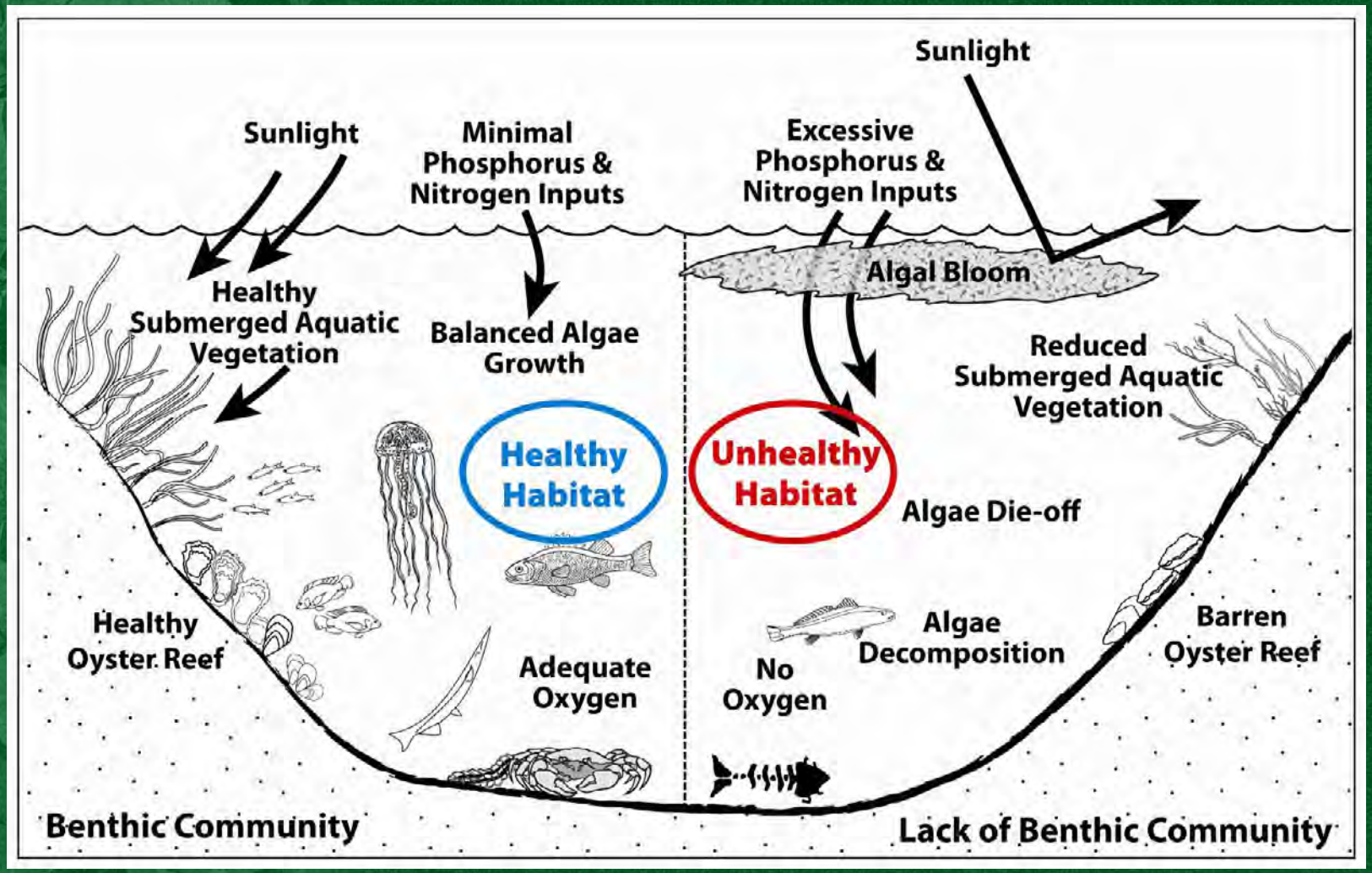
Eutrophication: The process of excess nutrients (nitrogen and phosphorus) accelerating the growth of algae in a waterway, which often results in a decrease of oxygen in the waterbody.



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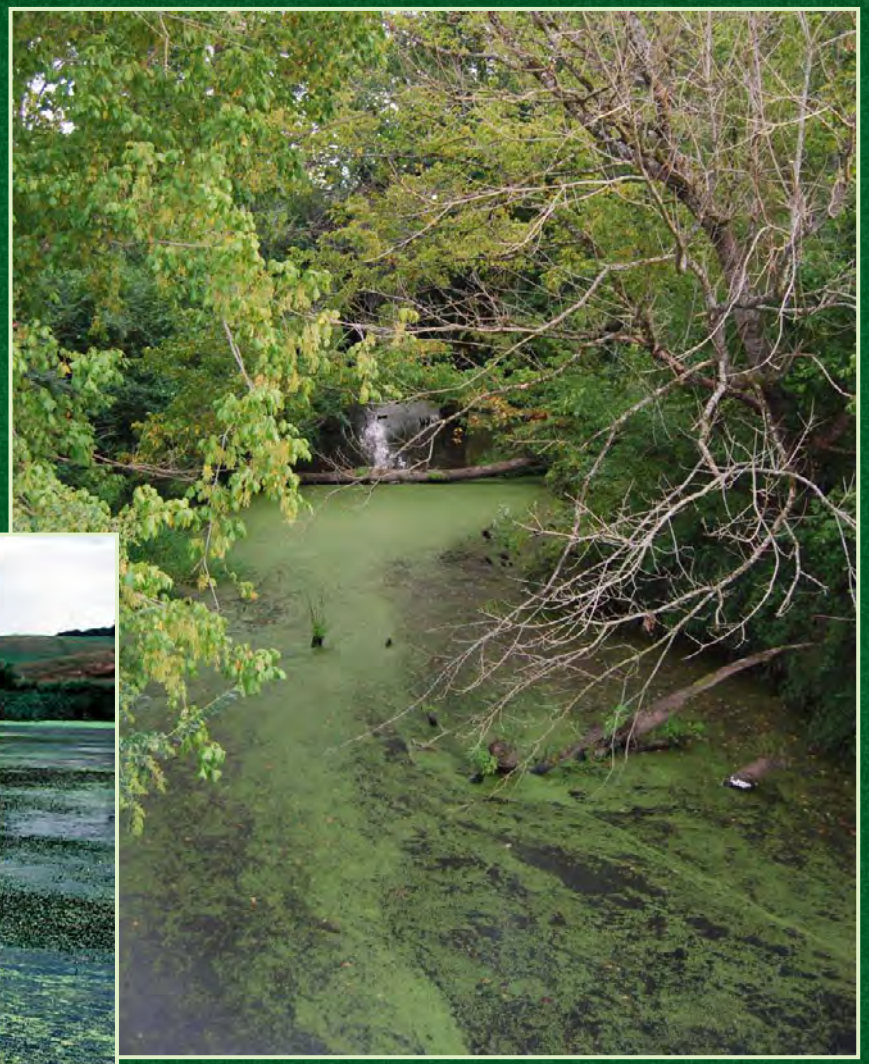
Eutrophic Waterways



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Nutrient Pollution Is a Serious Problem

- Waterbodies in almost every state and territory are impacted by nutrient pollution.
- States have identified more than 10,000 waterbody segments impaired by nutrients.

http://www.epa.gov/waters/ir/

Top Causes of U.S. Waterbody Impairments
• Mercury
• Pathogens
• Sediment
• Metals
• **Nutrients**

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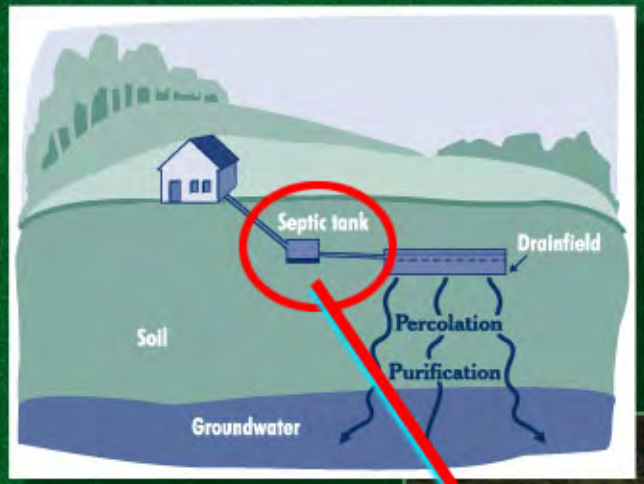
Nutrients that Enter Our Waters Come from a Variety of Sources



And More!

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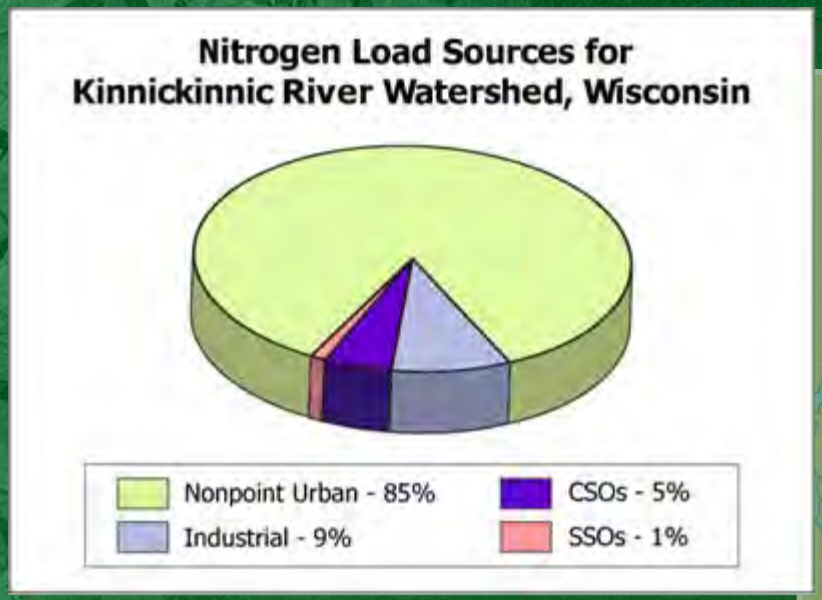
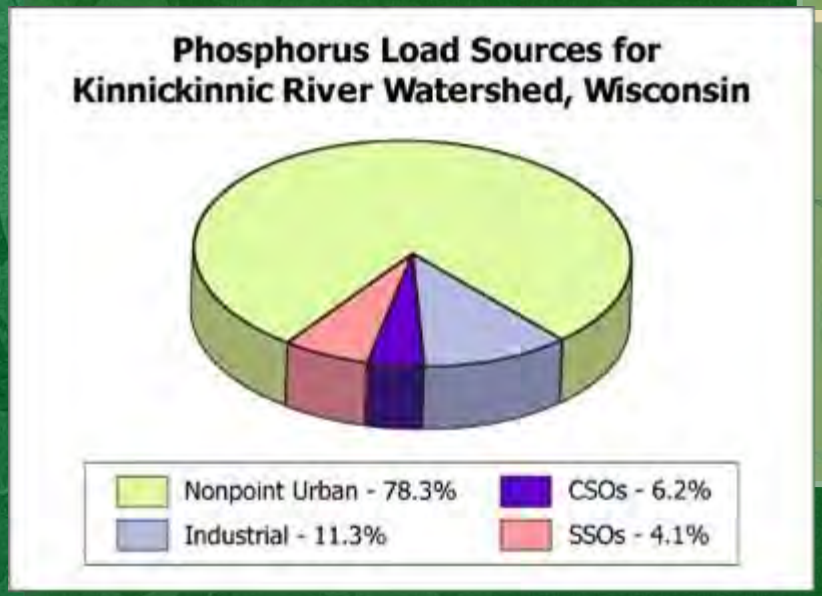
Kinnickinnic River, Wisconsin





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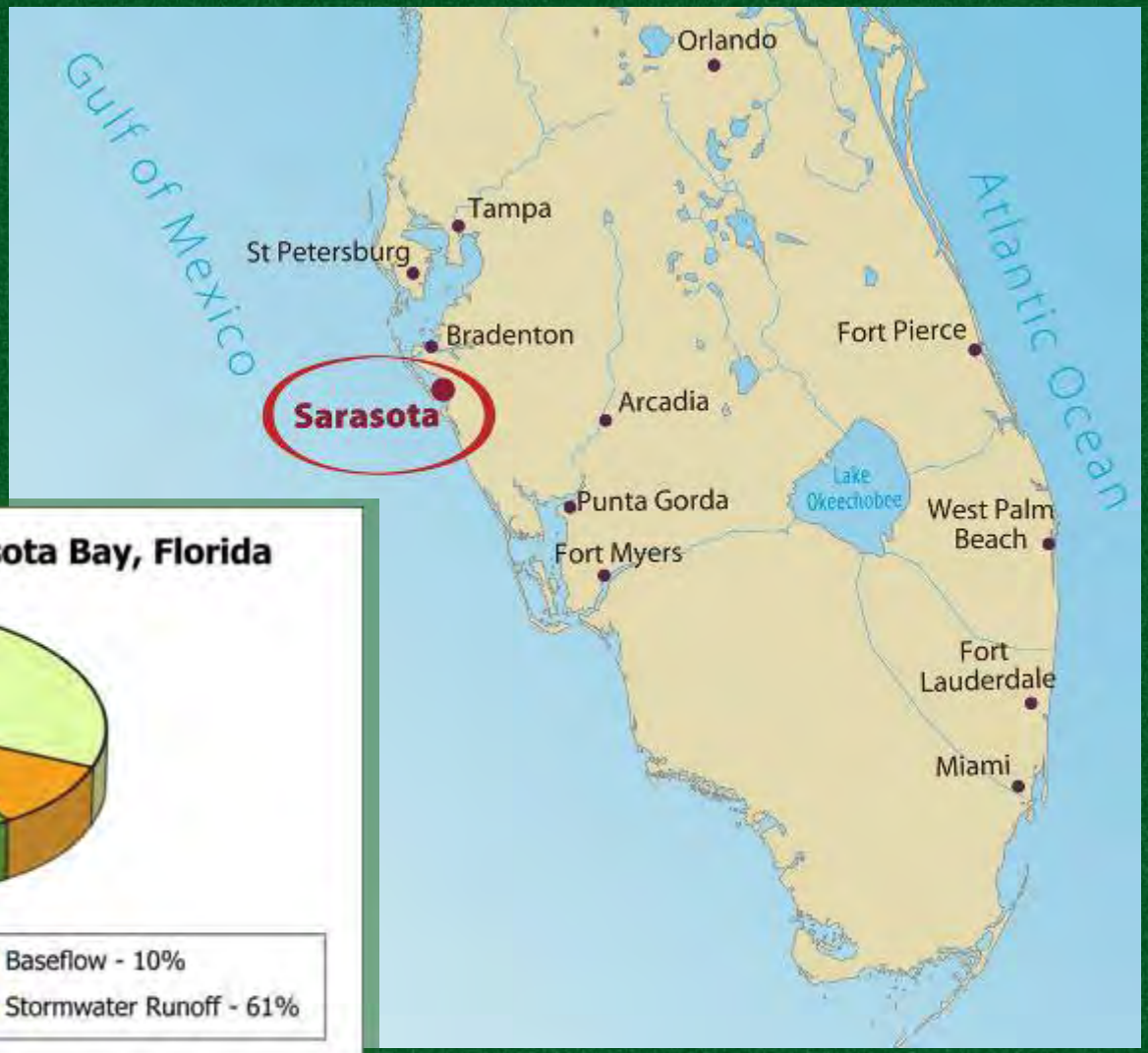
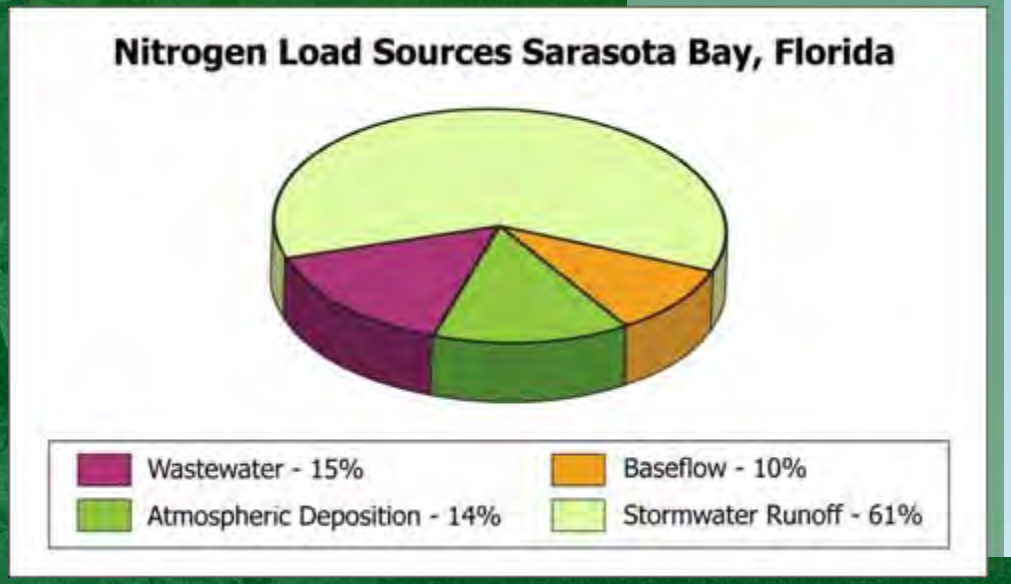
Sarasota, Florida





Note: Data taken from Sarasota Bay Estuary Program.
"*State of the Bay 2006*"

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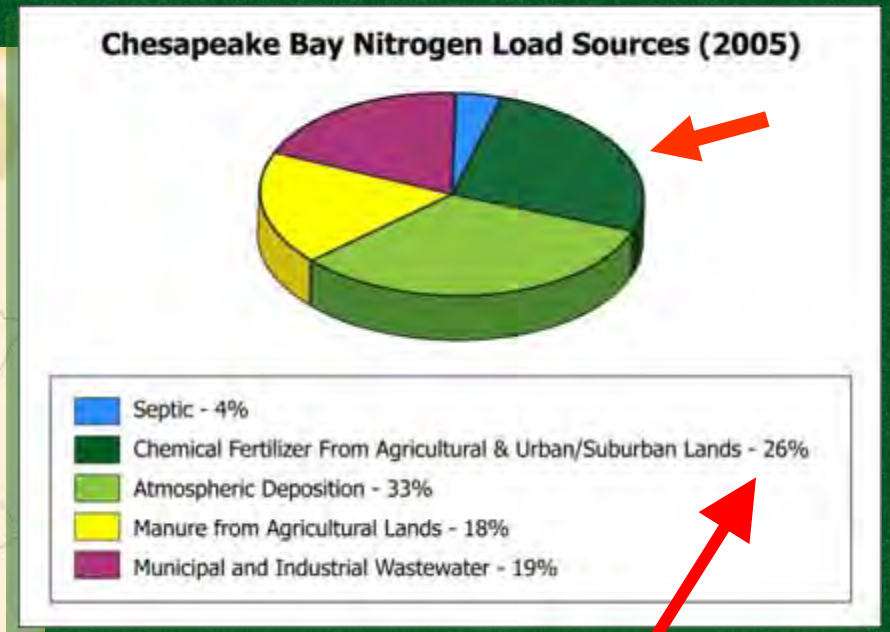
The Chesapeake Bay



Note: Data taken from the Chesapeake Bay Program www.chesapeakebay.net

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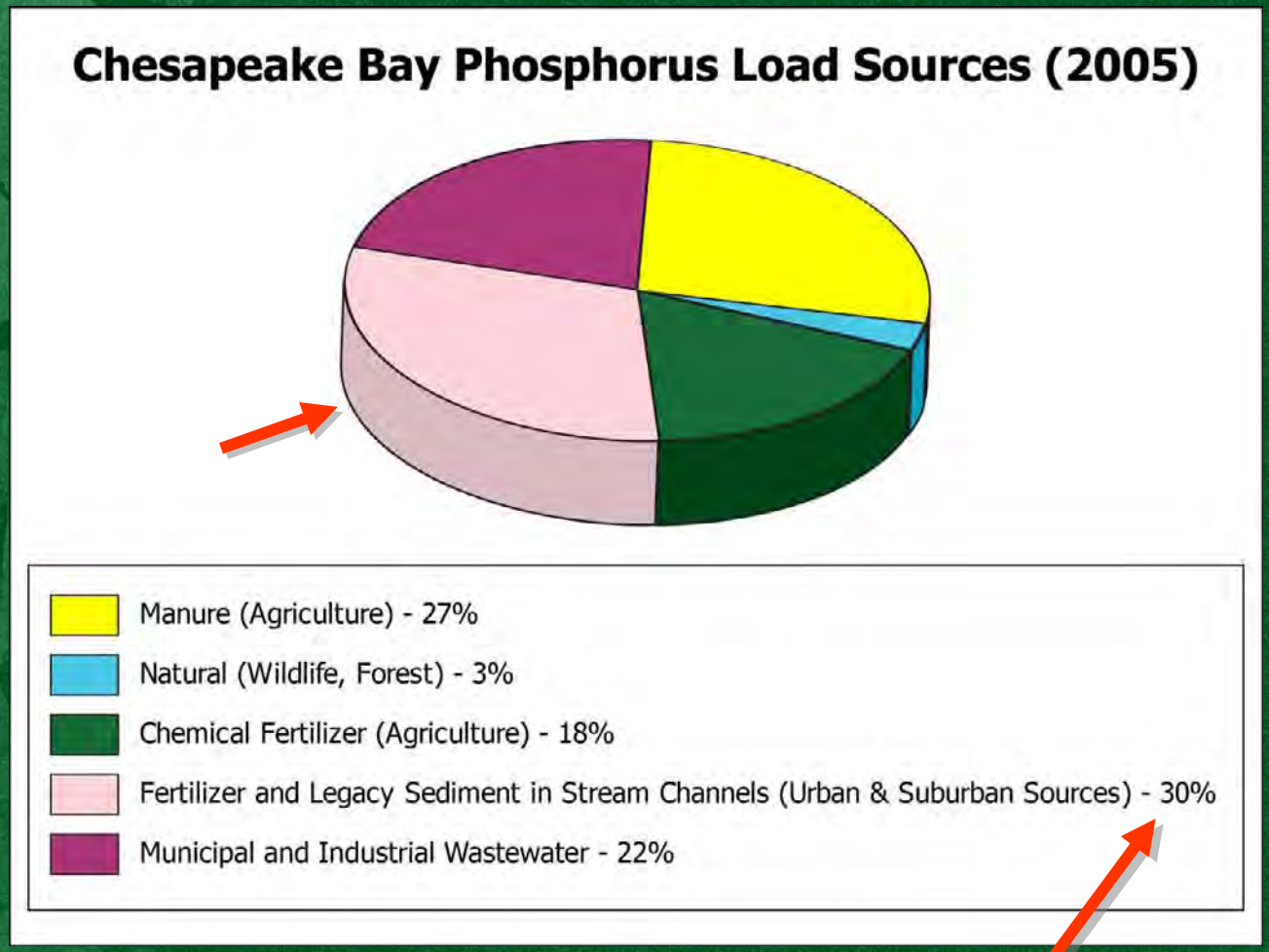
Chesapeake Bay - Phosphorus



Note: Data taken from the Chesapeake Bay Program www.chesapeakebay.net

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Soil Erosion Also Carries Nutrients to Waterways

Erosion not only washes away valuable soil but carries pollutants, including phosphorus, into waterways.

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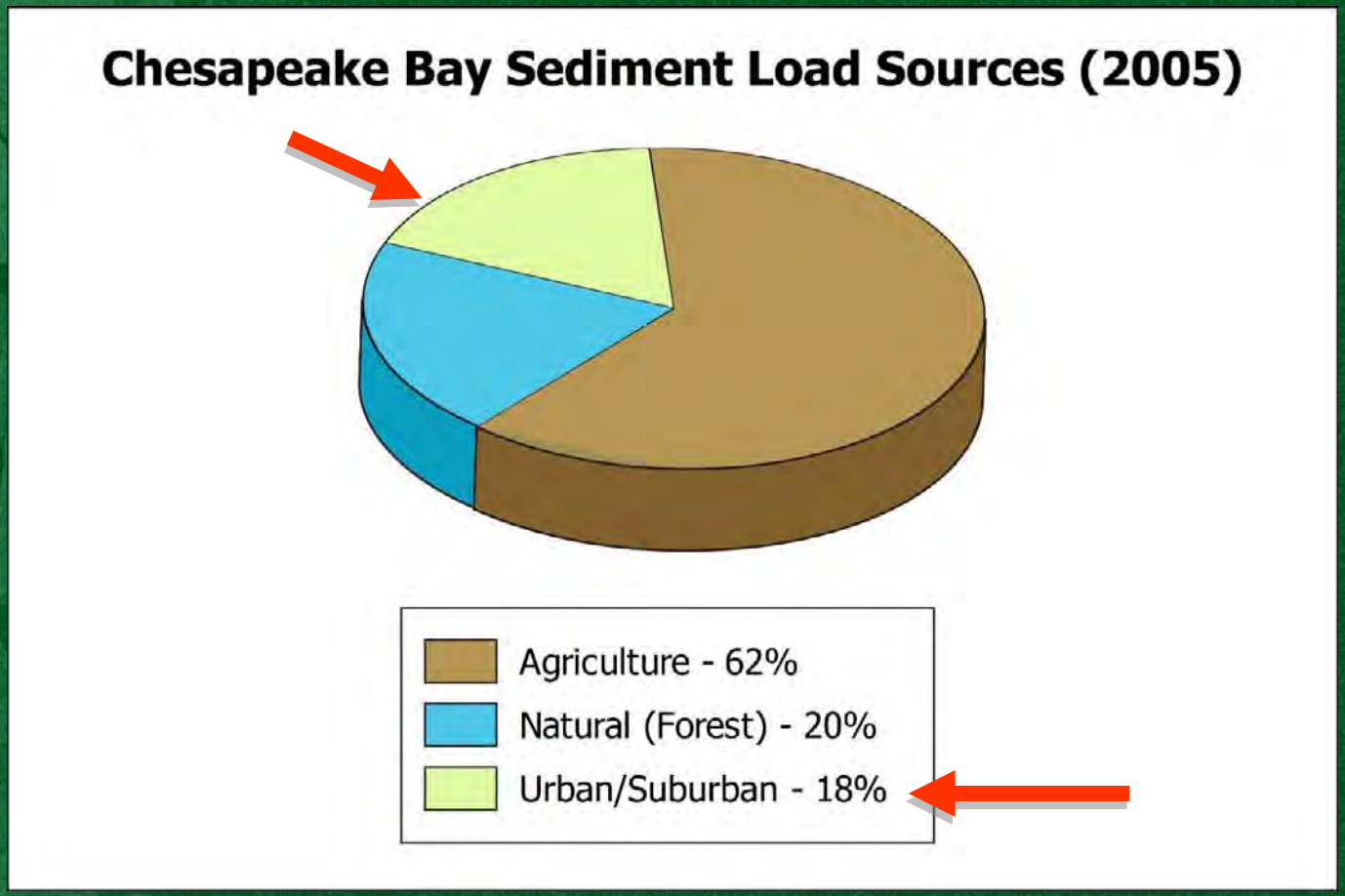
The Chesapeake Bay – Sediment



Note: Data taken from the Chesapeake Bay Program www.chesapeakebay.net

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Summary

Too much fertilizer is applied

Nutrients and sediment reach waterway

Algal blooms and other water quality problems result

So What Can You do About Nutrient Pollution?

It's simple! Follow these tips:

1. Test Your Soil
2. Apply Fertilizer Sparingly
3. Adopt Sustainable Lawn Care Practices
4. Improve Soil Drainage
5. Use Water Wisely
6. Plant Natives
7. Plant Lawn Alternatives
8. Get Involved in Your State's Water Quality Standards!

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Tip#1: Test Your Soil First!

- Soil test results provide specific nutrient levels and the pH of the soil.
- They allow you to make an informed fertilizer selection.
- Where do you get a test kit?
  - Over-the-Counter kits are available at garden centers
  - Tests run by skilled labs are available from local extension offices

60% of Tennessee residents use fertilizer regularly. Only 25% of those who report using fertilizer also used soil tests.

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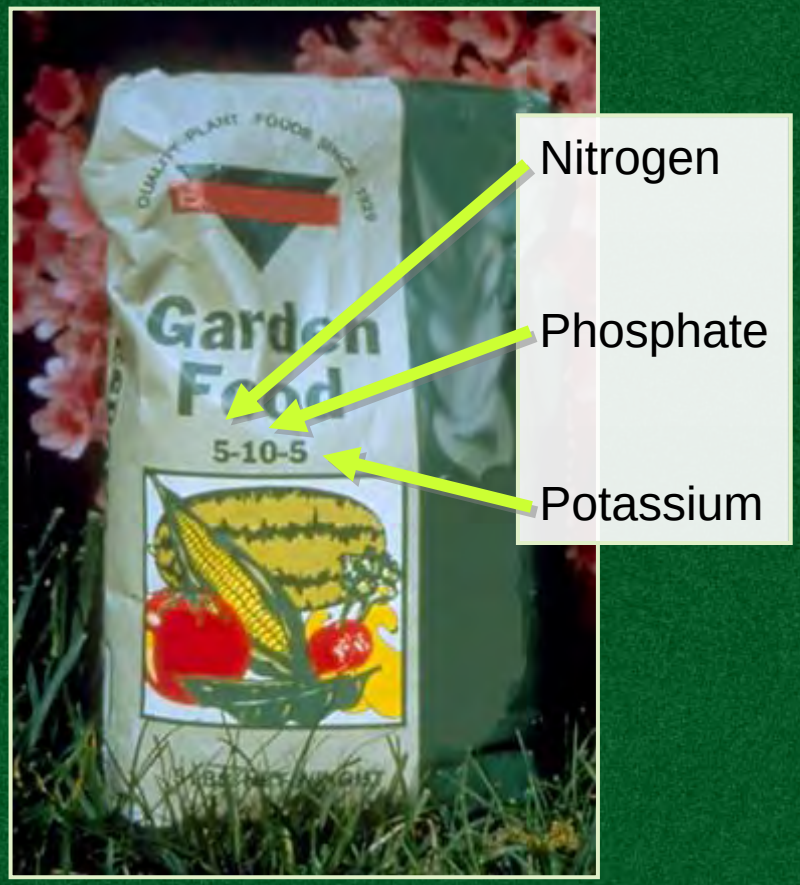
Tip#2: Use Fertilizer Sparingly

- Fertilizer Basics
  - Fertilizer has three numbers on the label
    - 1st number: % nitrogen
    - 2nd number: % phosphorus (or its compound phosphate)
    - 3rd number: % potassium (also listed as potash)
- Your fertilizer selection should address the needs of your soil based on the results of the soil test.



Fertilizer Application Best Practices

- Read the instructions – apply the correct amount at the correct time of year – more is NOT better.
- Match the fertilizer to your plants – the appropriate fertilizer for your roses might not be the correct one for your lawn.
- If there is a forecasted weather event, like high winds or rain, fertilize after the weather event.
- Spread fertilizer only to vegetated areas. Don't fertilize sidewalks, driveways and other paved surfaces! Sweep up spills.
- Leave an unfertilized buffer between a waterway and where fertilizer is applied.

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Tip#3: Adopt Sustainable Lawn Care Practices

Select the grass that fits your geographic region

	Cool Season Zone – Fertilize in the Fall	Warm Season Zone – Fertilize in the Late Spring/Early Summer	Transition Zone
Examples:	Fescue, Bluegrass, Ryegrass	Zoysia, Bermuda	Warm or cool season grasses can be selected
Ideal Height	2” – 4”	½” – 1”	
Typical Geographic Region	Throughout Northern United States	Southern United States: Texas to North Carolina and as far north as Tennessee	Between the Cool and Warm zones, running east to west – Virginia to Southern California

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Other Lawn Care Tips

"If grass were harvested as a crop, it would represent one of the United States' largest commodities (USDA, 1992)."

- Compost grass clippings and leaves.
- Aerate your lawn.
- Use a bagless lawn mower and allow the lawn and leaf clippings to decompose on the lawn.
- Never apply fertilizer, pesticides or herbicides within 10 feet of a stream, creek or other waterway.
- When mowing, only remove the top third of the grass height.
- Plant buffer strips along drainage ditches and waterways.
- Use mulch to reduce the need for fertilizers.

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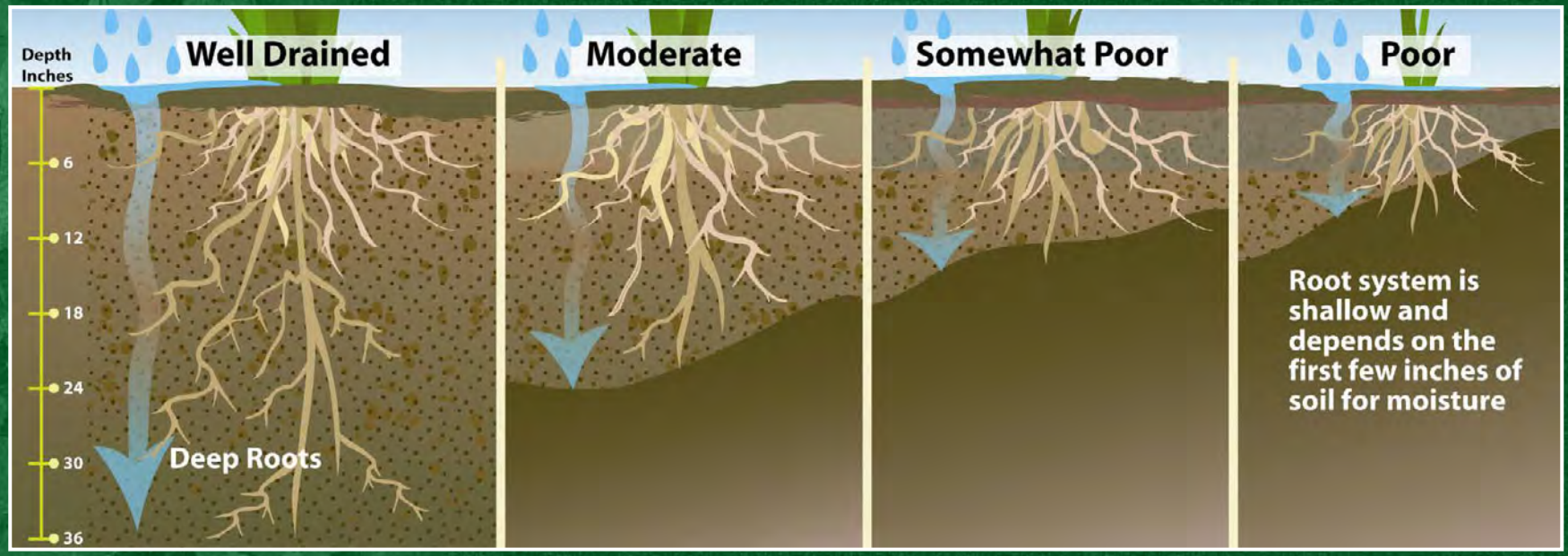
Tip #4: Improve Soil Drainage

- Evaluate the amount of impervious surface on your property. Can it be reduced?
- A well-drained soil creates a good environment for grass, plants and trees to set deep roots and take advantage of deep water and nutrients.



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Improve Soil Drainage with Composted Material or Mulch

- The proper soil alterations can help a soil drain faster or slower and increase its nutrient content.
- Well-composted organic material acts as a source of slow release nutrients for plants.
- Thoroughly blend or till compost into the soil.

Tip#5: Use Water Wisely

- Use water in moderation (if at all).
- Water only the places that require moisture.
- Use drip systems or micro-emitters to help keep water and fertilizers in place.
- Water plants “deeply”—encouraging the roots to grow deeper and lessening the need for future watering.
- Water in the early morning or evening and skip watering on windy days.
- Install a rain barrel to use in watering your plants.

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Using Water Wisely

- Recycle household water for watering plants instead of pouring it down the drain.

  For example:

  - Old water in a dog/cat bowl
  - Left over water in a glass
  - Water used to boil vegetables and wash fruits and vegetables

Want More Tips for Water Conservation? Visit

- EPA Water Sense: www.epa.gov/WaterSense
- EPA Brochure *Make Your Home the Solution to Stormwater Pollution*: www.epa.gov/npdes/pubs/solution_to_pollution.pdf
- Rain Garden and Rain Barrel Information – www.stormwaterauthority.org/library/view_article.aspx?id=944

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Tip#6: Plant Natives

- Reflect the local, natural history
- Provide food and habitat for local and migratory animals
- Reduce the need for chemical pesticides, herbicides and fertilizer
- Are adapted to local climate and soil types

Exotic plants that lack environmental stressors, like disease or pests, will out-compete native plants and will decrease the area's biodiversity.

Did you know that English Ivy is a non-native plant? It spreads aggressively, killing native plants and trees by covering and shading them out. English ivy also hosts bacterial leaf scorch, a plant pathogen that spreads to native elms, oaks, and maples.

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Tip #7: Plant Lawn Alternatives
Create a Rain Garden or Bayscape

Bayscaping	Rain Garden
Located in dry or moist areas	Located near downspouts and other drainage areas where water collects following a storm
Visually more interesting than a lawn	
Reduces time and expense for mowing, watering, fertilizing and maintaining	
Addresses erosion, poor soil, steep slope or poor drainage problems	
Utilizes native plants	
Reduces stormwater runoff and allows water to slowly percolate through the soil; allows up to 30% more water to percolate through the soil	

Sample Bayscape

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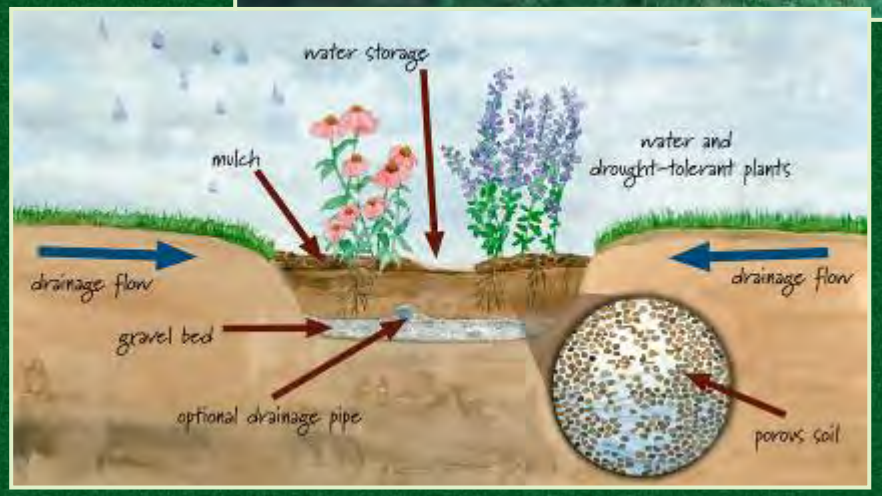
Getting Your Rain Garden Started:

- Don’t forget the soil test!
- Position the garden downhill of the water source.
- Remember – it is a garden, not a pool.
- Make it a community event!
- Post a sign explaining your rain garden.



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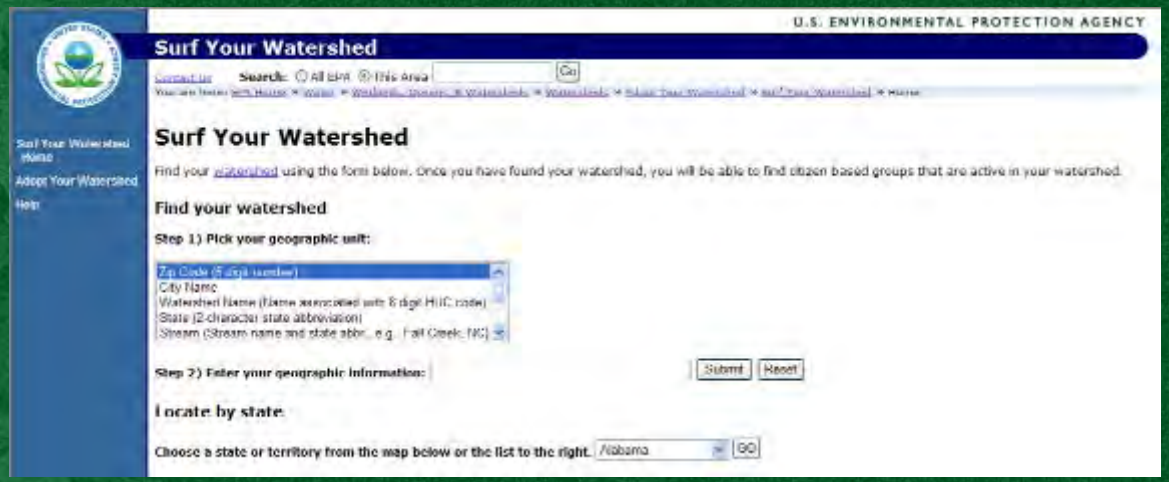
Tip #8: Get Involved in Your State's Water Quality Standards!

- Visit EPA's Surf Your Watershed Web site http://cfpub.epa.gov/surf/locate/index.cfm

  Once you locate your watershed, click on *Citizen-based Groups in Your Watershed* to learn about local ways that you can get involved in water monitoring and other watershed-related activities.



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Get Involved in Your State's Water Quality Standards

- Participate in the public review process of your state's water quality standards

  http://www.epa.gov/waterscience/standards

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Synopsis

1. When present in the proper quantities, nutrients and algae are important components of an ecosystem. In excessive amounts, the ecosystem becomes out of balance.
2. Your choice of plants impacts the need for supplemental watering and fertilization.
3. Keeping soil covered with plants or mulch is an important step to protecting water quality.
4. Soil test results will tell you the type of fertilizer that is needed. Always follow the fertilizer application directions.
5. Spread the word to your friends and neighbors!

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To Learn More, Visit:

Environmentally Friendly Landscaping:

- Backyard Conservation (Includes Fact Sheets): http://www.nrcs.usda.gov/feature/backyard
- EPA WaterSense Landscape Irrigation Services: http://www.epa.gov/WaterSense/pp/irrprof.htm
- Florida Friendly Landscaping: http://www.floridayards.org/
- Home and Garden Tips: http://www.nrcs.usda.gov/feature/highlights/homegarden/lawn.html

EPA Water Quality Standards and How to Get Involved:

- EPA – Locate Your State Environmental Agency: http://www.epa.gov/epahome/state.htm
- EPA – Water Quality Standards for Nitrogen and Phosphorus Pollution: http://www.epa.gov/waterscience/criteria/nutrient/
- EPA – Water Quality Standards Online Academy: http://www.epa.gov/waterscience/standards/academy
- EPA – National Nutrient Strategy Current Status: http://www.epa.gov/waterscience/criteria/nutrient/strategy/status.html

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More Places to Visit:

Rain Gardens:

- The New Jersey Native Plant Society's Rain Garden Manual: http://www.npsnj.org/rain_garden_home.htm
- Wisconsin Department of Natural Resources – A How-To Manual for Homeowners: http://www.dnr.state.wi.us/org/water/wm/dsfm/shore/documents/rgmanual.pdf
- Virginia Department of Forestry – Rain Gardens (includes Rain Garden Technical Guides): http://www.dof.virginia.gov/rfb/rain-gardens.shtml
- 10,000 Rain Gardens: http://www.rainkc.com