

The Citizen's Guide to Reducing Polluted Runoff in Coastal Alabama

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Acknowledgements



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Introduction

After the rain...

The next time it rains, imagine what happens when the water hits the ground and flows away. Water flowing across streets and parking lots picks up dirt, trash, oil, grease, bits of rubber tires, animal waste, and other things left behind by motor vehicles, people, and animals. Rain falling on construction sites, farmland, timberland, and bare earth becomes muddy with sediment. Golf courses, farms, home gardens, and lawns often add fertilizers and chemicals to storm water runoff. Septic tanks can contribute sewage to the runoff. And it all mixes together and flows away as nonpoint source pollution, sometimes called polluted runoff.

Where does stormwater go?

Stormwater runoff goes directly into our streams, lakes, rivers, and the Gulf of Mexico. Besides affecting fish and other wildlife, this kind of pollution can also contaminate our own drinking water supplies. In fact, more than half of the water pollution in the United States now comes from polluted runoff. Point sources, such as outfalls from sewage treatment plants or industrial facilities, have been regulated under state and federal laws since the early 1970s. But nonpoint source pollution from contaminated runoff has only recently become a major target of pollution control efforts.

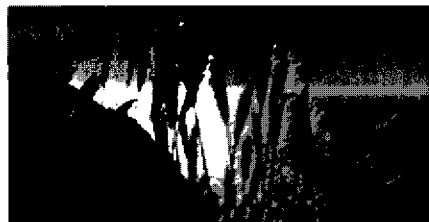
Who's responsible for nonpoint source pollution?

Everyone, in one way or another, is likely to be part of the problem. This means that everyone can also be a part of the solution! This handbook is a guide to the major causes of the problem in coastal Alabama and to what individuals, families, and community groups can do to turn the tide against nonpoint source pollution. It's up to us!



What Is a Watershed?

All water runs downhill to some body of water. A watershed is the area of land from which all water, sediments, and dissolved material runs downhill to the same stream, pond, lake, river, wetland, estuary, or ocean. No matter where you are, you are standing in a watershed, and nearly everything that you do affects the quality of that receiving water. Watersheds cross political boundaries and tie cities, states, and counties together. Alabama has 10 major watersheds with many more subwatersheds.

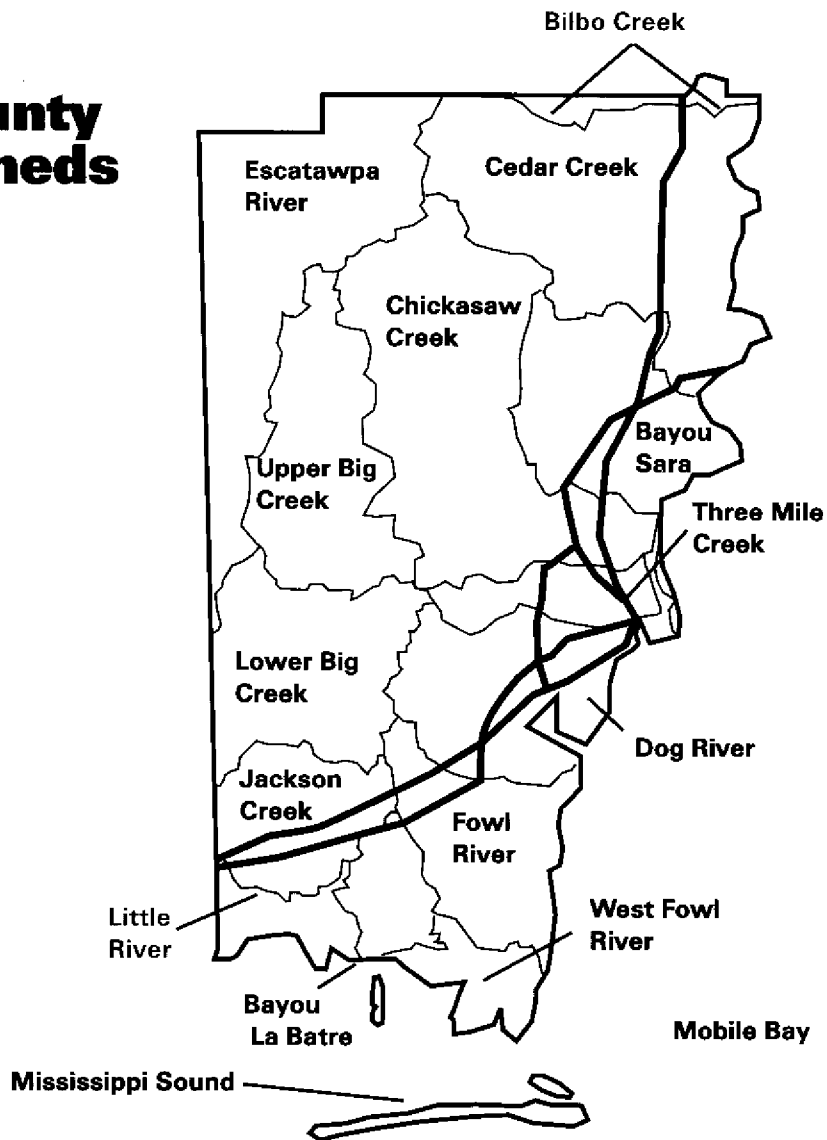


Alabama's Coastal Watersheds

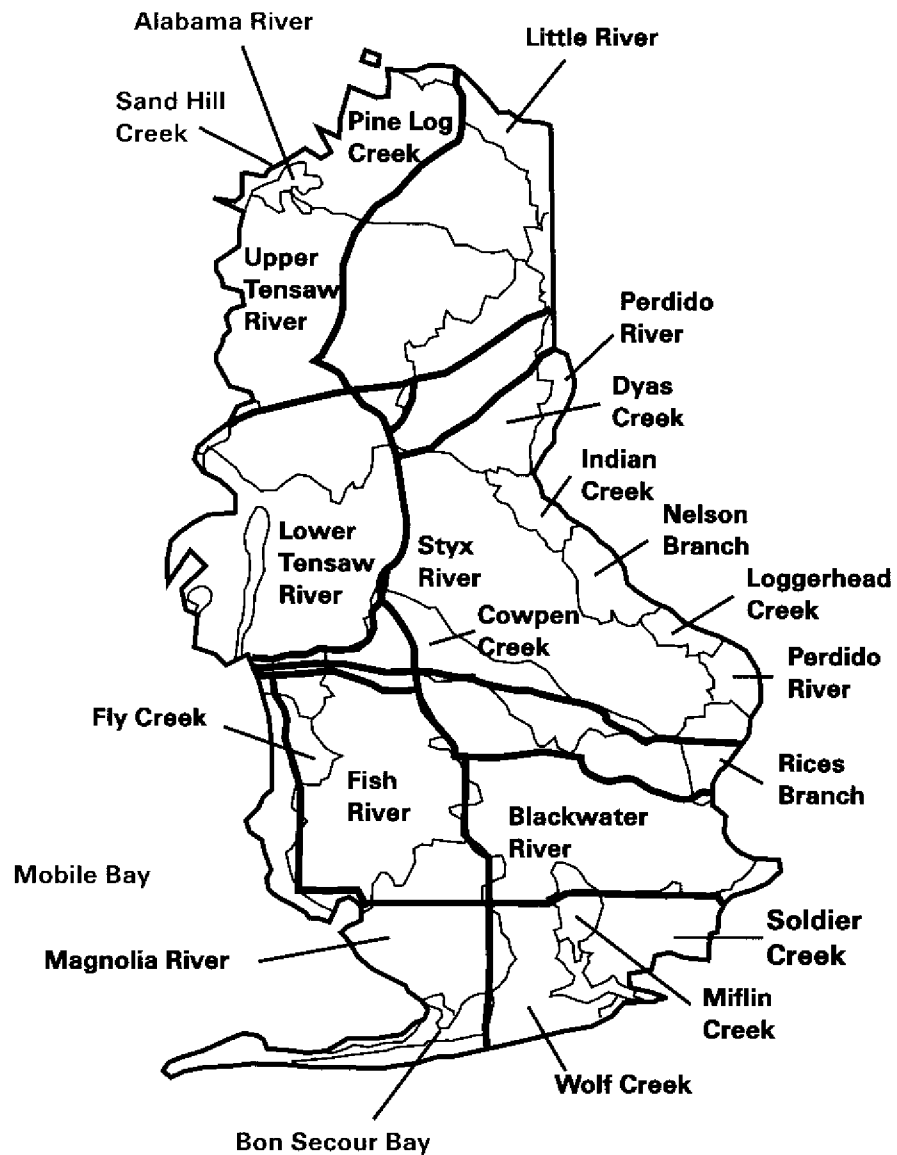
Mobile and Baldwin counties are within three of the state's major watersheds: the Escatawpa River Watershed, the Mobile Bay Watershed, and the Perdido River Watershed. According to the Mobile Bay National Estuary Program's publication *Our Water Our Future*, Mobile Bay alone drains 65 percent of Alabama and parts of Georgia, Tennessee, and Mississippi. Forty subwatersheds make up the two coastal counties. Find your subwatershed on the following pages. Remember: a subwatershed may contain many other creeks not named on the map.



Mobile County Subwatersheds



Baldwin County Subwatersheds



What's the Point in Nonpoint Source Pollution?

Bacteria and Viruses

Stormwater runoff may become contaminated with raw sewage from failing septic systems, overflowing sewer lines, pet waste, farm animals, or wildlife. This runoff can contain bacteria and viruses that may cause illnesses in people following swimming or the consumption of raw or improperly cooked shellfish. Even if the bacteria are not directly dangerous to humans, they can still cause shellfish beds to be closed to commercial and recreational oyster harvesting. This is because when health officials test water quality, they usually don't try to identify every type of bacteria or virus that may be harmful. Instead, they look for bacteria that are always found in the intestines of mammals. If these bacteria are found, they may indicate the presence of other harmful organisms. When intestinal bacteria are found in waters around shellfish beds, the areas are closed to oyster harvesting to protect human health.

Trash

Paper, plastic containers and wrappers, cans, cigarette butts, yard waste, and other kinds of trash are often dumped into drainage ditches or alongside roadways. When carried into our waterways by stormwater, this trash can cause oxygen depletion, change habitats for aquatic life, and physically damage fish, birds, and other animals. Even if trash is buried or burned, harmful substances can still be released from dumpsites or as air pollution.

Toxic Chemicals

Most households use numerous chemicals that can be harmful if they enter our waterways. Motor vehicle wastes contain a variety of heavy metals, such as cadmium, lead, and mercury, as well as harmful organic chemicals. Used batteries contain zinc, lead, and mercury. Discarded smoke detectors contain radioactive substances.

Pesticides

Farmers, home gardeners, and golf course operators often use various chemicals to control pests. Many households use weed killers, pet shampoos, flea collars, and no-pest strips containing chemicals that can be harmful to other plants and animals.

Sediments

Dirt suspended in runoff can increase death among fish eggs and larvae, erode the gills of mature fish, and completely destroy habitats used as spawning areas by many fish. Accumulated sediments can fill stream channels and increase flooding. Suspended sediment can interfere with light needed by aquatic plant life. Sediment particles can attract other kinds of contaminants and become carriers for toxic chemicals and metals such as lead and mercury. Contaminated sediments that settle on the bottom of our streams, lakes, and coastal waters can pollute water and aquatic life for extended periods.



Fertilizers & Nutrients

All plants need various nutrients to grow and reproduce. Three major nutrients are nitrogen, phosphorus, and potassium. Stormwater can collect these nutrients from fertilizers and household chemicals. Excess nutrients in streams, lakes, and coastal waters can cause algae and aquatic weeds to grow to the extent that they compete with fish and other aquatic life for space and oxygen. When the algae die, their large, decomposing mass can consume so much oxygen that aquatic life can no longer survive. Unsafe levels of the nutrient nitrite in drinking water can cause serious health problems, particularly in newborn babies.

Oxygen-Consuming Substances

Like decomposing algae, other kinds of decaying organic material can also consume oxygen. Bacteria and other microscopic organisms also consume oxygen as they break down organic materials. This decomposition process helps reduce pollution, but large amounts of organic materials require more bacteria, which consumes more oxygen. Some chemicals, such as ammonia, also consume oxygen.

Motor Vehicle Fluids

Antifreeze, battery acid, brake fluid, gasoline, and motor oil are poisonous to fish, shellfish, and many other forms of aquatic life. They readily accumulate on roads and parking areas and are easily washed off by rainfall. Some people wrongly dispose of these fluids by pouring them on the ground or down storm drains.

Polluted Runoff: Where Does It Come From? What Can We Do About It?

Lawns and Gardens

Well-maintained lawns and gardens can be of real benefit to water quality and the local environment. They add beauty, control erosion, filter runoff from adjacent hard surfaces, reduce dust, and help moderate summer heat. But lawns and gardens are often the reason for excessive water use and unnecessary application of fertilizers and pesticides.

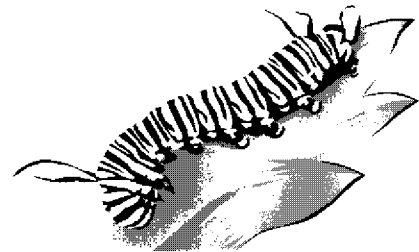
What Can We Do?

- Reduce soil erosion by planting appropriate plant cover on bare patches of ground.
- Reduce water requirements of your landscaping by selecting native plants or plants suited to the local environment with minimal need for supplemental watering (this is called xeriscaping—the “x” is pronounced like a “z”).

- Reduce water requirements by using drip irrigation or soaker hoses and by mulching.
- Limit the amount of lawn to what will actually be used for play, recreation, etc. Consider rock gardens or shrubs and trees that also provide habitat for insect-eating birds.
- Group plants with similar requirements and match plant water requirements with the soil's moisture-holding capacity.

Alternative Ways to Control Pests

- **Insecticidal soap**—Useful against aphids, red spider mites, and mealy bugs.
- **Soft soap**—Mild dish soap kills many insects, but only if it directly touches them.
- **Copper fungicide**—Controls various mildews and blights.
- **Alternate planting**—Alternate rows of vegetables with herbs that attract pest predators.



- Use only fertilizers that are really needed, based on soil tests and the actual requirements of your plants.
- Keep fertilizer off driveways and sidewalks where it will be washed into storm drains.
- Avoid using fertilizers within 75 feet of a wetland or waterway.
- Do not apply fertilizers or pesticides if heavy rain is expected.
- Consider organic, nonchemical fertilizers, such as blood meal, organic mixes, or compost you might make from your own household wastes.
- Practice Integrated Pest Management: select appropriate pesticides, time the application to be most effective with the smallest dose, use pest-resistant crops, and encourage natural controls, such as pest predators.

- Encourage beneficial birds and insects that reduce pests, build the soil, pollinate plants, and perform other useful functions.
- If you use a lawn care service, request natural management instead of chemical management methods, have your soil tested to determine actual requirements, and examine

labels of all pesticides used and ensure that required precautions and application methods are followed.

- Contact your county Extension agent for information on xeriscaping and Integrated Pest Management.



Household Chemicals

Most households contain numerous chemicals that can be dangerous if released into the environment: spot remover, furniture polish, deodorizers, drain cleaner, oven cleaner, disinfectants, moth repellents, ammonia, paint and other finishes, thinners, solvents, batteries containing heavy metals, and swimming pool chemicals. These chemicals can become pollutants if residues are discarded with garbage, poured down home drains, into storm drains, or onto the land surface.

What Can We Do?

- When buying household chemicals, read the labels. Select the least toxic product that will do the job and use only when absolutely necessary.
- Try alternatives to toxic chemicals (see "Managing a Home Chemical Spill").
- Use only recommended amounts of chemicals.
- Keep kitty litter or other absorbent material handy to clean up spills.
- Don't apply chemicals near cisterns, wells, or water bodies.
- Don't mix chemicals together.
- Don't burn or bury leftover chemicals or containers.
- Stuff used cans of paint, thinner, or other finishes and solvents with newspapers and allow to dry before putting the cans into the trash.
- Never pour household chemicals down drains, storm drains, or onto the ground.
- Participate in local programs for hazardous household waste disposal; if there isn't such a program in your area, work with local agencies to start one.
- Recycle: Donate extra paint to a local church, theater group, or school.

Managing a Home Chemical Spill

To clean up small spills:

- **Wear rubber gloves, long pants, and rubber boots if a pesticide has been spilled.**
- **If outside, surround the contaminated area with dirt.**
- **Sprinkle sawdust, kitty litter, or other absorbent material over the spill.**
- **Shovel or sweep the absorbent material into a strong plastic bag and put it in the garbage.**
- **If the spill is on concrete or another hard surface, wash down the area with a strong detergent, and avoid runoff into storm drains or local waters.**



Alternatives to Hazardous Household Chemicals

Instead of	Try
Ammonia-Based Cleaners	Vinegar + Salt + Water
Abrasive Cleaners	Lemon Dipped in Borax or Salt + Baking Soda
Furniture Polish	Lemon Juice + Olive Oil
Toilet Cleaner	Baking Soda & Toilet Brush
Oven Cleaner	Liquid Soap + Borax + Warm Water
Disinfectants	Water + Borax
Drain Cleaners	Boiling Water + Baking Soda + Vinegar
Upholstery Cleaners	Dry Cornstarch
Mothballs	Cedar Chips or Lavender Flowers
Plant Insecticide	Soap + Water
Window Cleaner	White Vinegar + Water
Silver Polish	Soak in Water + Salt + Baking Soda + a Piece of Aluminum Foil

Solid Waste Disposal

Most households discard food scraps, paper products, wrappers, and containers made of glass, plastic, or metal every day. Solid waste is an increasing problem as landfills are becoming more difficult to site and expensive to operate. Runoff seeping through older landfills can carry many contaminants from decomposing garbage. Incinerators can help solve the landfill problem, but they are also more expensive to operate and can contribute to air pollution and water pollution by creating acid rain.

What Can We Do?

- Reduce your consumption of disposable products and products with excessive packaging.
- Buy biodegradable or recyclable products whenever possible.
- Make a compost pile (see "Notes on Composting").
- Never dump grass clippings or other yard waste into or near a storm drain or waterway.
- Participate in recycling programs.



Notes on Composting

Grass clippings, leaves, fruit and vegetable scraps, crushed eggshells, tea bags, and coffee grounds are good candidates for composting.

Two types of composting are possible. Hot composting is practical for people with a large amount of waste material and it can produce compost in a month. Cold composting is better for small amounts of material, but it takes at least six months to produce compost.

Compost piles can be as small as 3 ft x 3 ft x 3 ft, but smaller piles may not be able to hold enough heat for composting. Compost piles larger than 5 ft x 5 ft x 5 ft may not get enough air to support compost bacteria at the center of the pile.

For complete instructions on composting, contact your Alabama Cooperative Extension Agent (see Local Resources section).

Excessive Water Use

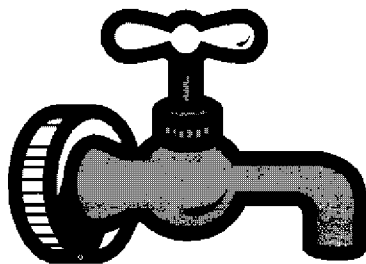
Unnecessary water use not only contributes to local water shortages but also adds to the volume of wastewater that must be treated by septic tanks or sewage treatment plants. As a result, excessive water use contributes to higher bills for energy, water, and sewer services. The average person in the United States uses about 100 gallons of water each day; only 4 gallons are actually essential to life. We would decrease our water consumption by 15 to 20 percent simply by adopting better water use habits.

What Can We Do?

- Check for toilet leaks by putting food coloring into the tank. If colored water appears after 30 minutes without flushing, a leak exists that should be repaired.
- Turn off water and your hot water heater when going on a trip.
- Take short showers instead of baths.
- Don't run water continuously when washing dishes, brushing teeth, shaving, etc.
- Consider eliminating your garbage disposal. These devices not only consume

large amounts of water but also add organic materials to sewage treatment systems.

- Install a water-conserving shower head.
- Run dishwashers and clothes washers only with full loads.
- Reduce the volume of your toilet tank with plastic bottles filled with water (don't use bricks!); you'll have to experiment to find the minimum volume needed for satisfactory operation.



Motor Vehicles

The oil from a single automobile engine can produce an eight-acre oil slick, and a single quart of motor oil can contaminate as much as two million gallons of drinking water. Used oil, antifreeze, and other motor vehicle fluids are often dumped into storm drains or roadside ditches. The pollution caused by improper disposal of used motor oil in the United States is equal to fourteen Exxon Valdez spills every year! The problem is even worse if we consider the oil, grease, and other fluids that leak from poorly maintained vehicles and contaminate runoff from roads, driveways, and parking lots. Many cats and dogs have died after drinking sweet-tasting water from puddles contaminated with antifreeze.



What Can We Do?

- Maintain motor vehicles and repair leaks promptly.
- Dispose of used motor oil and antifreeze at local recycling centers.
- Avoid gas tank overflows during refueling by determining the amount of fuel needed based on estimated fuel consumed and the capacity of the fuel tank.



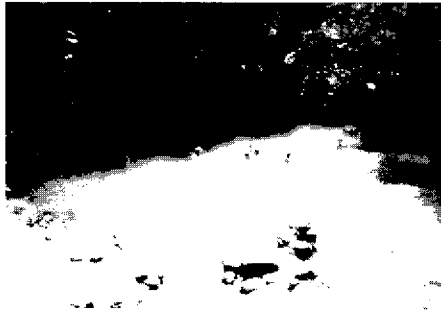


Boating

Recreational boaters use a variety of cleaners, finishes, and antifouling compounds, and are often responsible for discharging garbage, sewage, and petroleum products into our waterways. Boats that create excessive wakes contribute to shoreline erosion and increase sediment loads to adjacent waterways.

What Can We Do?

- Avoid producing wakes within 500 feet of shore.
- Scrub boats with brush and water instead of routinely using soap or detergent.
- If cleansers are needed to remove stains, use phosphate-free detergents.
- Avoid toxic polishes and stain removers.
- Avoid gas tank overflows during refueling by determining the amount of fuel needed based on estimated fuel consumed and the capacity of the fuel tank.
- Avoid direct discharge of boat sewage into waterways.
- Instead of disinfecting your marine toilet with bleach, use $\frac{1}{2}$ cup borax to 1 gallon of water.
- Use pumpout stations.
- Take the Boater's Pledge: Bring trash ashore for recycling or disposal.
- Use a drop cloth when scraping boat hulls to catch toxic paint or antifouling chips.
- Encourage marine operators to use porous paving and adopt other runoff control practices described under *Hard Surfaces*.



Septic Systems

A properly operating septic tank system can be a safe and effective means of disposing of household wastewater. The whole process depends on bacterial action and soils that can absorb the outflow. If the drain field is damaged or the soil becomes saturated, nearby wells and surface waters may become contaminated with sewage products including bacteria, solids, and oxygen-consuming substances.

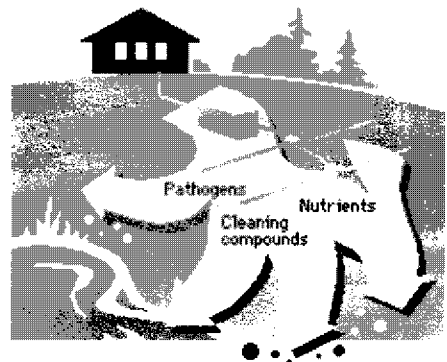
Sanitary Sewer Overflows

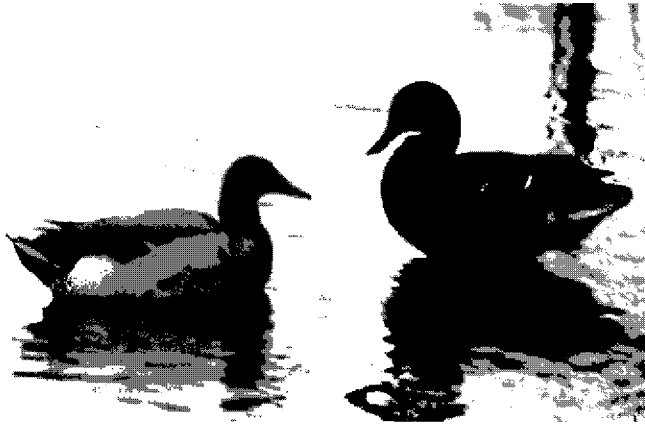
Occasionally, sanitary sewer lines may crack, break, or become blocked or clogged with dirt, grease, or foreign objects. When this occurs, sewers leak or overflow, spilling hundreds of thousands of gallons of raw sewage into our waters.

What Can We Do?

- Keep heavy vehicles and plant roots away from drain field pipes.
- Avoid putting household chemicals down the drain that could destroy septic tank bacteria.
- Conserve water and stagger water-intensive uses, such as laundry, that could overload the system.

- Have your septic system inspected annually and pumped out every 3 to 5 years.
- Consider giving up garbage disposals that add unnecessary solids and grease to the system.
- Keep these out of the system: oils, fats, and grease; coffee grounds; cigarettes; facial tissues and paper towels; sanitary napkins, tampons, and disposable diapers.
- Use toilet paper that decomposes quickly.
- Be alert for bright green grass growing over the drain field. This could indicate sewage leakage near the surface.
- Divert runoff from the drain field area to reduce the likelihood of saturating the soil.



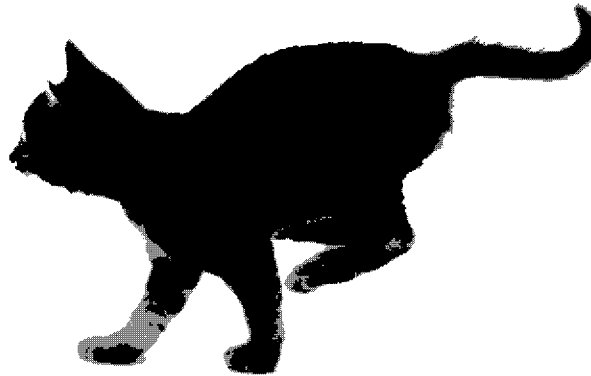


What Can We Do?

Clean up after pets and dispose of wastes in the trash or toilet.

Animal Waste

Animal waste is high in nutrients as well as bacteria. It can contribute to excessive plant growth in waterways as well as to the closure of shell-fishing beds and swimming areas because of bacterial contamination. Many pet owners do not believe that their one animal could make much difference, but when the wastes from all the pets in a typical neighborhood are added together, the impact is significant.



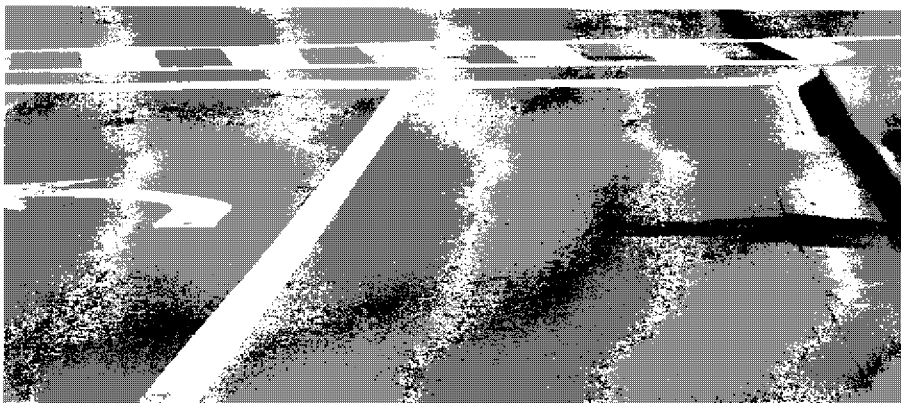


Hard Surfaces

Paved roads, driveways, rooftops, and parking lots are common in most communities. Unlike forests and fields that allow rainwater to soak into the ground, these hard surfaces cause rainwater to flow rapidly into ditches and storm drains—and directly into our waterways. Because of this rapid runoff, a typical city block generates nine times more runoff than a woodland of the same size. Two-thirds of the nation's stormwater runoff comes from highways and roads.

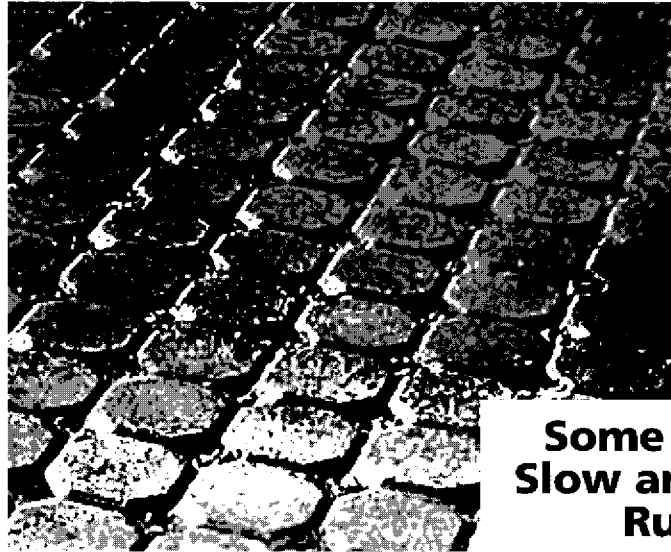
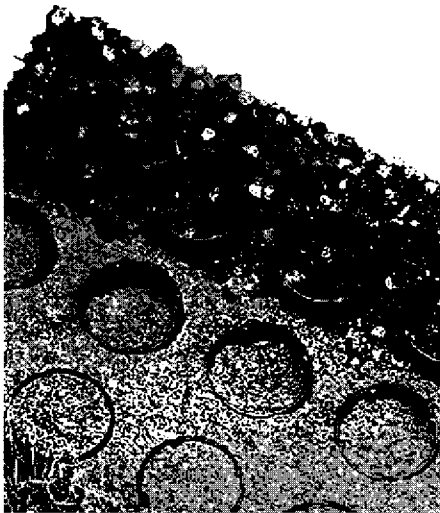
What Can We Do?

- Follow suggestions outlined in this handbook for septic tanks, animal wastes, motor vehicles, farms, lawns, and gardens.
- Incorporate retention ponds, oil and grease separators, etc., into designs calling for large paved surfaces (see *Resources* section for more details).
- Wash your car only when necessary.
- Use a bucket or pistol grip nozzle to keep from running water unnecessarily.
- Limit paved or other impervious surfaces on your property and consider alternatives to solid concrete.
- Before washing your car, park on paving blocks, gravel, or your lawn.
- Slow and spread the flow of runoff to allow absorption into the ground.
- Direct downspouts to stabilized pervious or vegetated areas on your property.



Some Alternatives to Solid Concrete

- Bricks
- Interlocking pavers
- Flat stones
- Gravel
- Crushed stone or shell
- Bark chips
- Precast concrete lattice pavers
- Wood decks



Some Ways to Slow and Spread Runoff

- Channel runoff into basins, hollows, and depressions that can act as temporary holding areas.
- Contour or terrace gardens to reduce runoff and erosion.
- Plant vegetation to take advantage of wet areas and to reduce the impact of direct rainfall.
- Install gravel trenches (at least 12 inches wide and 3 feet deep) along drive-ways and patios.





Farms

Because croplands, pastures, and ranges can contribute more sediment, oxygen-consuming substances, nitrogen, and phosphorus to surface waters in the United States than other sources of nonpoint pollution, it is especially important for farms to properly manage animal wastes, plant cover removal, and application of chemicals. Poor farming practices can result in storm-water runoff contaminated with sediment, nutrients, pesticides,

bacteria, and oxygen-consuming substances. In many cases, nonpoint source contamination can result from accepted farming methods that have been used for many years. This contamination can be reduced by improved management and by constructed systems that contain or reduce pollutants at their source.



What Can We Do?

- Plant vegetation at the base of steep slopes and in drainage ditches to slow the rate of runoff and trap pollutants.
- Keep heavy equipment off exposed soil during rainy periods.
- Practice conservation tillage, a variety of techniques, such as no-till or strip-till, that avoid leaving large areas of exposed soil for extended periods.
- Construct retention ponds and basins to slow runoff and trap sediment.
- Control animal grazing to prevent pasture overgrazing.
- Drag pastures frequently to spread manure and promote uniform grazing.

- Leave wetlands, stream banks, channels, and stream-side vegetation in their natural condition to provide a buffer between cultivated areas and waterways.
- Adopt the principles of Integrated Pest Management: select appropriate pesticides, time the application to be most effective with the smallest dose, use pest-resistant crops, and encourage natural controls, such as pest predators.
- Locate feed and nutrient storage facilities away from streams and drainages.

- Provide storage facilities (this may be as simple as a canvas cover over a manure pile) that prevent collected animal wastes from washing away.
- Apply liquid manure during dry months when there is less chance of water contamination and during the active growing season when nutrient uptake by plants is at its maximum.
- Locate areas of heavy animal use where runoff cannot mix with manure.
- Fence animals away from streams.



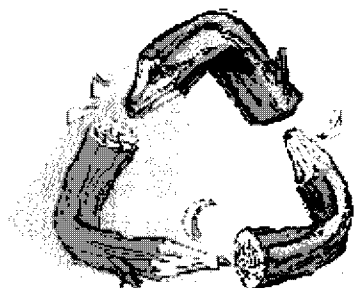
Forestry

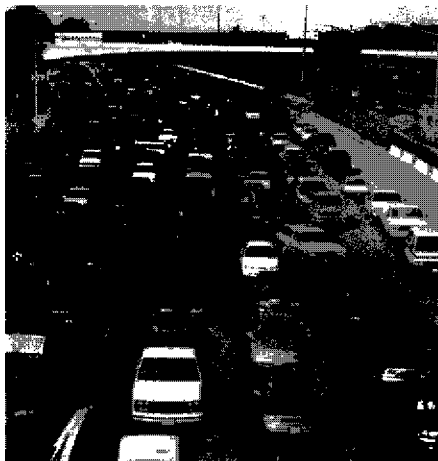
Because forested watersheds act as filter systems for runoff, they are important to drinking water supplies, recreation, and fisheries. These benefits can be impaired by forestry practices that cause nonpoint source pollution. Road building, harvesting, logging, and pesticide application can pollute water with sediments, chemicals, and organic materials unless precautions are taken to control such contamination.



What Can We Do?

- Plan and construct roads to minimize disturbed area and control sediment loss.
- Minimize stream crossings by roads.
- Revegetate and close roads that are no longer needed.
- Establish buffer strips (generally 40 to 80 feet wide) along streams; for details, contact your local Natural Resources Conservation Service.
- Consider special logging, harvesting, storage, and hauling techniques that minimize soil disturbance.
- Follow guidelines for pesticide and fertilizer application described under *Lawns and Gardens*.





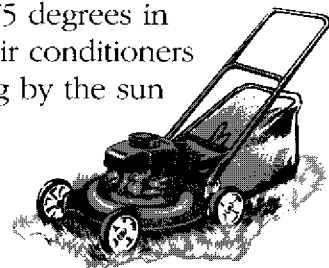
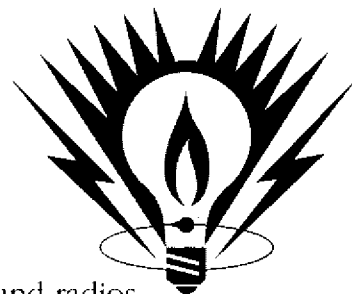
Air Emissions

Rainwater can be contaminated before it even hits the ground if it falls through polluted air. Acid rain is the most familiar example of this type of contamination. Air pollution with sulfur and nitrogen compounds results primarily from burning fossil fuels, especially coal and oil. These fuels are burned primarily for electricity production and motor vehicle transportation.

What Can We Do?

Conserve Energy!

- Turn off lights, televisions, stereos, and radios in unoccupied rooms.
- Consider using appliances, such as manual can openers and push-type lawn mowers, that do not require electricity or fossil fuel.
- Pay attention to energy-efficiency ratings on new appliances and automobiles.
- When possible, walk or bicycle instead of driving.
- Keep doors and windows closed when air conditioners or heaters are in use.
- Investigate alternative energy sources, such as solar and wind power.
- Keep refrigerators closed as much as possible.
- Set thermostats at 68 degrees in winter and 75 degrees in summer; you may be able to use heaters and air conditioners even less if you can take advantage of warming by the sun or cooling by wind.
- Every 3 months, vacuum the coils on the bottom or rear of refrigerators to remove dust.
- Choose a smaller, more fuel efficient car for everyday use.



Glossary

Acid rain - Rainwater that becomes acidic due to sulfur dioxide and nitrogen oxide in the air.

Algal bloom - An overgrowth in algae caused by an increase in nutrients.

Aquifer - Large concentration of groundwater similar to an underground lake.

Best management practice (BMP) - A method, activity, maintenance procedure, or other management practice for reducing the amount of pollution entering a water body.

Biodegradable - Able to be broken down by living organisms.

Carcinogen - A substance known to cause cancer.

Chemical oxygen demand (COD) - Oxygen consumed by chemicals introduced into water body.

Compost - Fertilizer made with nonmeat food scraps, leaves, grass clippings, soil, and water.

Contaminant - A substance that adversely affects the environment.

Cumulative effects - The combined environmental impacts that accumulate over time and space from a series of similar or related individual actions, contaminants, or projects; while the individual impacts may seem minor, the combined effect can be severe.

Detention - Collecting and holding back stormwater for delayed release to receiving waters.

Dissolved oxygen - Oxygen present in water and, therefore, available to fish and other aquatic life.

Drainage basin - Another term used to describe a watershed.

Erosion - Wearing away of rock or soil through the gradual detachment of soil or rock fragments by water, wind, ice, and other mechanical and chemical forces.

Eutrophication - Over-enrichment of water by phosphates and/or nitrogen that causes organisms to reproduce at increased rates.

Fecal coliform bacteria - Bacteria normally found in the intestinal tracts of warm-blooded animals; these bacteria are normally harmless to humans, but are used as indicators of the presence of sewage that may contain harmful bacteria and viruses; high fecal coliform bacteria levels can be caused by waste from animals other than humans, including household pets, farm animals and wildlife.

Flood plain - The relatively flat area on both sides of the stream channel that carries over-flow flood waters.

Groundwater - Underground water supplies stored in aquifers; the source of groundwater is rain that soaks into the ground and flows down until it is collected

at a point where the ground is not permeable.

Habitat - The specific area of environment in which a particular type of plant or animal lives.

Herbicide - A substance used to destroy or inhibit growth of vegetation.

Impervious cover - Areas of covered ground that limit the amount of water that soaks into the ground; examples include parking lots, roads, and roofs.

Leachate - Water or other liquid that has washed (leached) from a solid material such as a layer of soil or debris; leachates may contain contaminants.

Nonpoint source pollution - Contamination that comes from many diffuse sources rather than from a specific point such as an outfall pipe.

Nutrients - Chemicals required by plants or animals for growth; often used to refer specifically to nitrogen, phosphorus, and potassium needed by many plants.

Pathogens - Micro-organisms that cause disease.

Point source pollution - Contamination that comes from a specific definable source.

Pollution - An undesirable change in the physical, chemical, or biological characteristics of air, land, or water that is detrimental to human life, desired activities, or other species considered important by humans.

Riparian zone - The area adjacent to a stream that is often vegetated and constitutes a zone between the land and the stream; important in minimizing polluted runoff into a stream.

Sediments - Soil particles carried into water bodies.

Septage - The sludge and scum materials that are pumped out of a septic tank.

Storm drain - A system of gutters, pipes, or ditches used to carry stormwater from surrounding lands to streams, lakes, or coastal waters.

Stormwater - Water that is generated by rainfall.

Toxins - Chemical substances that can cause cancer or other harmful effects; toxics include heavy metals such as cadmium, lead, and mercury, as well as organic compounds such as petroleum products, polychlorinated biphenyls (PCBs), and polynuclear aromatic hydrocarbons (PAHs).

Turbidity - A measure of water clarity or lack thereof.

Water quality - A term that reflects the condition of water that is affected by natural processes and human activities; water quality means different things to different people, depending upon what they wish to do with the water (good water quality to a fisherman may mean plenty of fish to catch; good water quality to a public health official may mean that the water is safe to drink or swim in, etc.).



Watershed - An area from which all water, sediment, and dissolved material runs downhill to the same stream, pond, lake, river, wetland, estuary, or ocean.

Wetlands - Habitats where the influence of surface or ground water has resulted in development of plant or animal communities adapted to aquatic or intermittently wet conditions.

Xeriscaping - The practice of selecting plants suited to the local environment with minimal need for supplemental watering.

Resources

Alabama Cooperative Extension System

Auburn University Marine Extension and Research Center
4170 Commanders Drive
Mobile, AL 36615
(251)438-5690

Baldwin County Cooperative Extension Office
302A Byrne Street
Bay Minette, AL 36507
(251)937-7176

Mobile County Cooperative Extension Office
1070 N. Schillinger Road
Mobile, AL 36608
(251)574-8445

Alabama Department of Conservation and Natural Resources

Coastal Programs
1208 Main Street
Daphne, AL 36526
(251)626-0042

Alabama Department of Environmental Management

Nonpoint Source Unit
1400 Coliseum Boulevard
P.O. Box 301463
Montgomery, AL 36110-2059
(334)394-4360

Office of Education and Outreach

1400 Coliseum Boulevard
P.O. Box 301463
Montgomery, AL 36110-2059
(334)394-4360

Coastal Programs

4171 Commanders Drive
Mobile, AL 36615
(251)432-6533

Mobile Field Office

2204 Perimeter Road
Mobile, AL 36615-1131
(251)450-3400

Alabama Department of Public Health

Baldwin County

23280 Gilbert Drive
Robertsdale, AL 36567
(251)947-3618

Mobile County

251 N. Bayou Street
Mobile, AL 36603
(251)690-8101

Alabama Forestry Commission**Baldwin County**

32760 State Highway 59
Loxley, AL 36551
(251)964-6591

Mobile County

1070 N. Schillinger Road
Mobile, AL 36608
(251)639-9629

Baldwin County Commission**Planning and Zoning Department**

112 East 3rd Street
Bay Minette, AL 36507
(251)580-1655

City of Mobile**Planning and Zoning Department**

P.O. Box 1827
Mobile, AL 36633-1827
(251)208-7161

Keep Mobile Beautiful

451 Government Street
Mobile, AL 36602
(251)208-6029

**Mobile Bay National
Estuary Program**

4172 Commanders Drive
Mobile, AL 36615
(251)431-6409

Mobile County Commission**Public Works Department
Environmental Department**

205 Government Street
Mobile, AL 36644-1600
(251)694-3229

**U.S. Department of Agriculture
Natural Resources
Conservation Service****Baldwin County**

1504 C Highway 31 South
Bay Minette, AL 36507
(251)937-7174

Mobile County

1070 N. Schillinger Road
Mobile, AL 36608
(251)441-6505

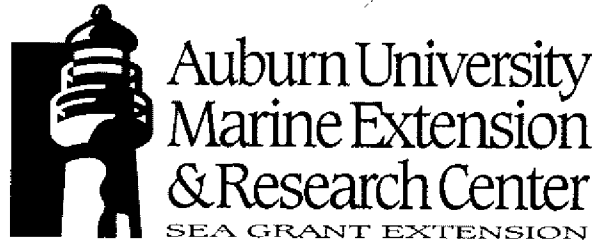
**U.S. Department of Agriculture
Gulf Coast Resource Conservation
and Development Council**

107 Courthouse Square
Bay Minette, AL 36507
(251)580-0195

**Weeks Bay National Estuarine
Research Reserve**

11300 U.S. Highway 98
Fairhope, AL 36532
(251)928-9792





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Jody A. Scanlan, *Agricultural Program Assistant I*, **Eve Brantley**, *Agriculture Program Associate I*, and **Richard K. Wallace**,
Extension Marine Specialist, Associate Professor, Fisheries and Allied Aquacultures, Auburn University

Auburn University Marine Extension and Research Center

4170 Commanders Drive
Mobile, AL 36615
(251)438-5690

www.ag.auburn.edu/dept/faa/aumerc

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