



SARASOTA BAY  
ESTUARY PROGRAM  
*Restoring Our Bays*



***Each of us** can play a major role in preserving and protecting our environment through our choices and actions everyday.*

*The Bay Repair Kit promotes practical guidelines for improving the quality of all of our waterways.*

*Thank you for being a steward of Sarasota Bay Estuary.*



**SARASOTA BAY**  
**ESTUARY PROGRAM**  
Restoring Our Bays



The Sarasota Bay Estuary Program (SBEP) began in June 1989 when Sarasota Bay was designated an “estuary of national significance” by the U.S. Congress as part of the Water Quality Act of 1987. SBEP is one of 28 EPA National Estuary Programs in the United States. There are four National Estuary Programs in the state of Florida including Indian River Lagoon NEP, Tampa Bay Estuary Program, and Charlotte Harbor NEP.

The Sarasota Bay Estuary Program has engaged in a number of partnerships over the years to accomplish Bay restoration goals. The work of a small staff can realize major accomplishments when its efforts are combined with partner funds and staff. SBEP depends on the continuous support and expertise of its partners to fulfill its mission.

The SBEP acknowledges its eight major partners:



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Manasota Basin Board of the  
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Sarasota County





**SARASOTA BAY  
ESTUARY PROGRAM**  
*Restoring Our Bays*

The Sarasota Bay Estuary Program is dedicated to restoring the region's greatest natural asset – Sarasota Bay. Since 1989, the program has improved water quality, increased habitat and enhanced the natural resources of the area for the use and enjoyment of the public.

For more info go to:  
[www.sarasotabay.org](http://www.sarasotabay.org)

The Sarasota Bay Estuary Program provides opportunities for local residents to be part of the important effort to help restore and protect Sarasota Bay.

**Bay Guardians:** Sarasota Bay Guardians is a volunteer program that began in 2010 and is run in partnership with Around the Bend Nature Tours. Bay Guardians was established to get families, teens, and children out in the field, where they learn about the flora and fauna of the region while engaging in activities that contribute to the restoration of Sarasota Bay.

**Bay Partners Grants Program:** SBEP provides full and partial grants every year to support projects that focus on Bay Restoration, Bay-Friendly Landscaping, and Bay Education. The purpose is to encourage local groups throughout the watershed that are doing projects that support Sarasota Bay.

**Bay Reflections:** Bay Reflections is an online newsletter that provides information about projects, programs, and events associated with the Sarasota Bay Estuary Program (SBEP). Please sign up at [www.sarasotabay.org](http://www.sarasotabay.org)

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### WHAT IS AN ESTUARY?

Estuaries are places where freshwater mixes with salt water from the sea. Teeming with life, our nation's estuaries provide vital habitats for 80 percent of the world's fish and shellfish species. Estuaries are one of our nation's most valuable natural resources, creating more food per acre than the richest farmland.



### WHAT IS STORMWATER RUNOFF?

Stormwater is rain and excess irrigation that “runs off” across the land instead of seeping into the ground. Runoff is significant in our area due to the extensive use of hardened surfaces common with urban development. The runoff flows through the watershed area to the lowest point which is Sarasota Bay.

Stormwater pollution refers to the collected pollution that's picked up by the water flowing through the watershed.



#### Stormwater pollution comes from many sources:

- Hydrocarbons from vehicles
- Bacteria and nutrients from pet waste
- Fertilizer that is not used by plants
- Pesticides
- Improperly disposed household hazardous waste
- Grass clippings blown into the storm drain
- Sediment from construction
- Litter, including cigarette butts

*You are the Solution to Preventing Stormwater Pollution*

## WHAT IS A WATERSHED?

A watershed carries water from the land after rain falls. Drop by drop, water is channeled into soils, groundwaters, creeks, and streams, making its way to larger rivers and, eventually, the Bay. What we do on the land affects water quality for all communities living downstream. To learn about how stormwater runoff gets into our watershed refer to the inside back cover.



*Aerial view of Sarasota Bay*



*Great egret*

### The Sarasota Bay Watershed

Sarasota Bay is a coastal lagoon system formed by a necklace of barrier islands to the west and the mainland of Manatee and Sarasota counties to the east. The map to the right provides an outline of the watershed. Everything that happens in the watershed eventually impacts the water quality, marine life, and habitat of Sarasota Bay.



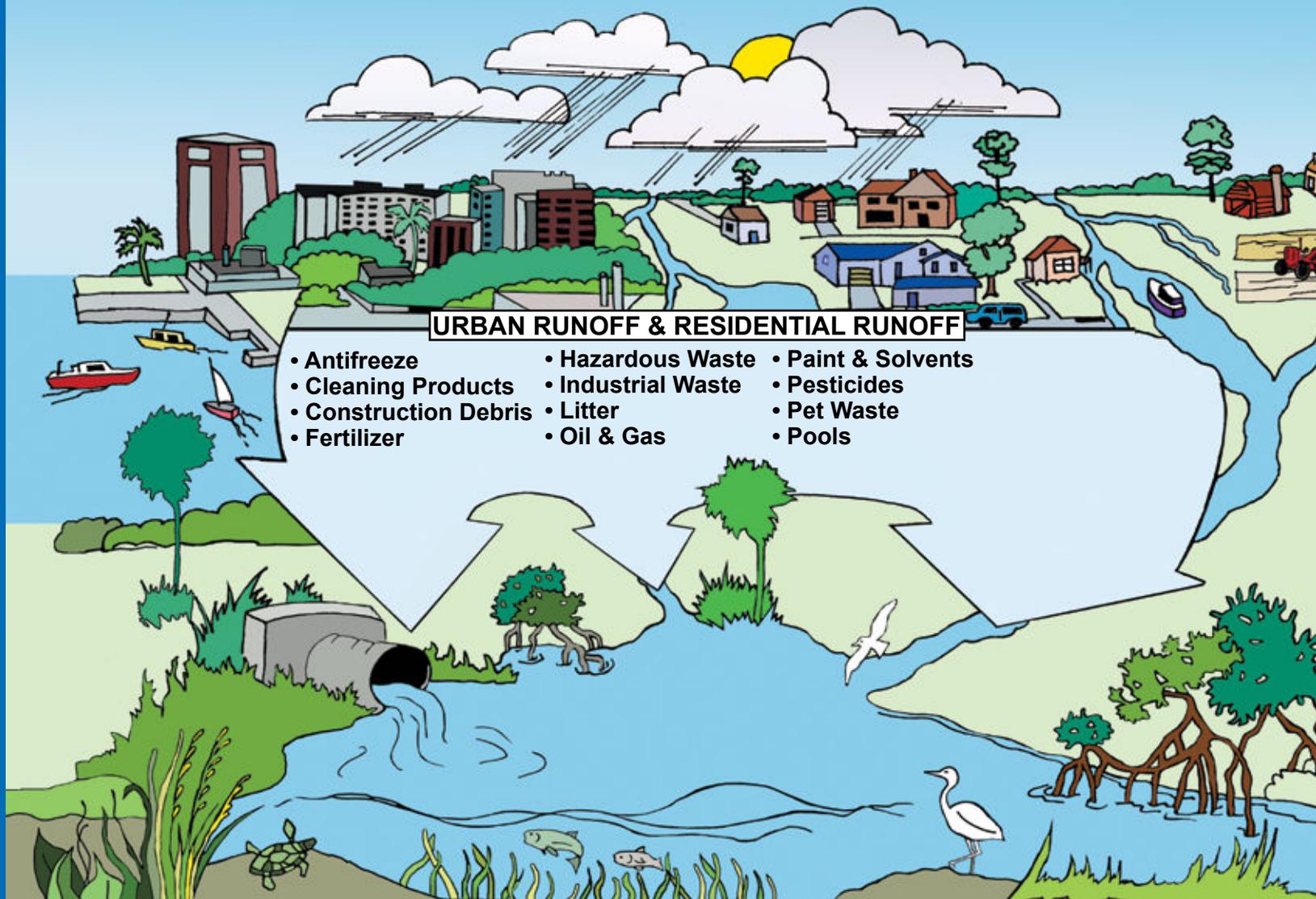
*Sarasota Bay Watershed*

## WHAT IS A WATERSHED?

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## FLORIDA'S WATER CYCLE: THE BIG PICTURE

- Rainfall – 150 billion gallons a day.
- Surface/groundwater outflow to Gulf and Atlantic – 66 billion gallons a day.
- Surface/groundwater inflow – 26 billion gallons a day (mostly from rivers that originate in Georgia and Alabama, which is the larger watershed for the northern third of Florida).
- Consumptive use – 2.7 billion gallons a day.
- Evapotranspiration – 107 billion gallons a day (water returning into the atmosphere).
- Nearly 40 percent of hurricanes making landfall in the US have hit Florida.
- Hurricanes typically bring 5-12 inches of rain, but as much as 39 inches.



### URBAN RUNOFF & RESIDENTIAL RUNOFF

- Antifreeze
- Cleaning Products
- Construction Debris
- Fertilizer
- Hazardous Waste
- Industrial Waste
- Litter
- Oil & Gas
- Paint & Solvents
- Pesticides
- Pet Waste
- Pools

### *Motorized Vehicles*

*How people in our region use and take care of their motor vehicles has a major impact on the quality of water and vitality of aquatic life in Sarasota Bay.*



## KEEPING SURFACE RUNOFF CLEAN

The very chemical-based products that help run the engines of our cars, boats, trucks, and motorcycles can also harm our tributaries and bay. This includes degreasers, oil, rust preventatives, radiator flushing products, and cleaning and waxing compounds.

### *Positive Actions*



- Maintaining your vehicle is the single best way to enhance performance, provide safety, and protect Sarasota Bay.
- Be alert about not spilling fuel or any other chemicals on the ground.
- Use sand or kitty litter to absorb larger spills.
- Never dump toxic liquids such as oil or antifreeze into sinks, storm drains, ditches, or directly onto the soil. See page 10 for a list of places where you can dispose hazardous and toxic waste.
- Use a mild, biodegradable, low-phosphate soap when washing any type of vehicle.
- Store toxic products in a protected area like a garage or shed and never outdoors.

## KEEP SURFACE RUNOFF CLEAN



### Litter

Cigarette butts are made of fiberglass and take seven years to biodegrade! A plastic bottle takes 450 years to disintegrate. Reduce, reuse and recycle. Curbside recycling is available in both Sarasota and Manatee Counties.



*Please recycle plastic containers!*

### Plastic Pollution

Many plastic bags that litter the ground eventually end up in our waterways. The consequences include serious harm and even death to wildlife and the smothering of vital seagrasses. Please consider reusable shopping bags as an alternative to plastic bags.

Plastic bottles are also a large threat to aquatic life. In order to limit plastic pollution consider using reusable water bottles; they protect the environment and help you save money.

### Compost

Composting is an alternative to throwing away some forms of trash. Compost is kitchen scraps (green

element) and yard debris (brown element) that have decomposed together to create a nutrient-rich and moist soil called humus. You can till the humus into the soil around your plants; this often replaces the need to fertilize!

- ▲ According to the Worldwatch Institute, Americans throw away more than 100 billion plastic bags annually. Only six percent of this total is recycled!
- ▲ Over seven million pounds of trash was picked up on the International Coastal Cleanup Day in 2009.
- ▲ One million seabirds and an estimated 100,000 mammals die each year from ingesting or becoming entangled with plastic and other trash.



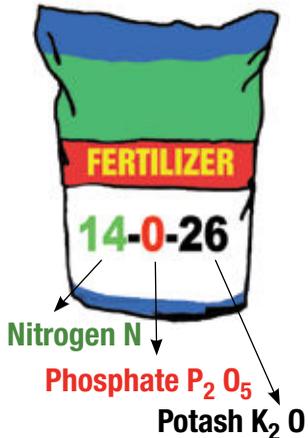
## What to look for on your fertilizer label.

% of Total N as

Slow-Release Nitrogen (SRN)

=  $7/14 \times 100 = 50\%$

(Meets 50% SRN Sarasota County Requirements)



*Avoid using fertilizer whenever possible. Shop for slow release fertilizers to minimize their potential damage.*

## Fertilizer

Fertilizer includes a variety of nutrients including nitrogen, phosphate, and potash. The major problem with most fertilizers is that the concentration of nutrients exceeds the amount needed by the plants or lawns being fertilized. Unused fertilizer dissolves in the water when it rains or in water from other forms of irrigation. A lot of these chemicals work their way through the watershed from higher elevations into storm drains and tributaries all leading to Sarasota Bay. Excess nutrients from fertilizer can cause algae blooms which harm the vitality of our water bodies.



## Recommended Fertilizer and Landscape Management Code

### Fertilizer-Free Zone

No fertilizer may be applied to impervious (non-porous) surfaces, and any spillage must be removed. Fertilizer may not be applied within 10 feet of any water body or wetland.

### Low-Maintenance Zone

A six-foot low-maintenance zone of landscape plants that prevent fertilizer runoff is recommended around any water body or wetland.

Licensing and certification: Professional landscape contractors must complete a course in proper fertilizer management and use protective bay practices. Proof of certification may be required in some areas.

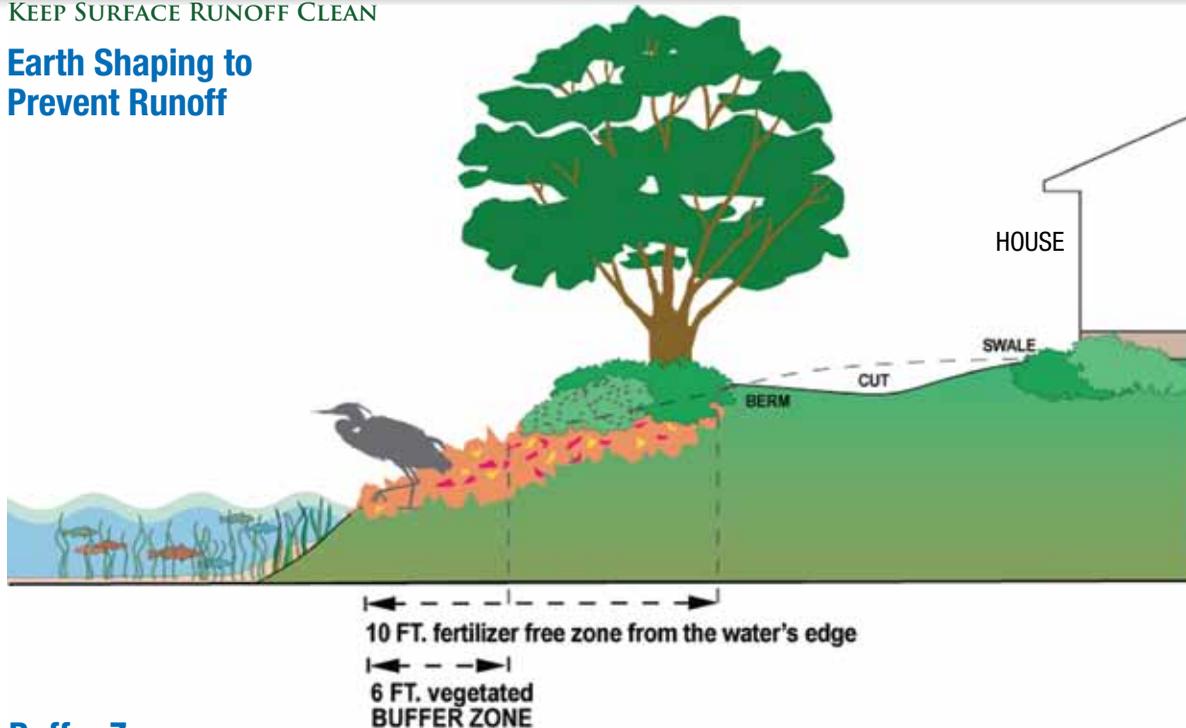
### Remember!

Sarasota and Manatee Counties passed ordinances for a **no fertilizer season**; no fertilizer containing nitrogen should be applied during the summer rainy season, June 1st through September 30th. The most recent Manatee County ordinance also banned the sale of Nitrogen and Phosphorous-containing fertilizers during that season.

Rainstorms don't water in fertilizer, they wash it away. That wastes money and pollutes our water.

KEEP SURFACE RUNOFF CLEAN

## Earth Shaping to Prevent Runoff



## Buffer Zones

Protect waterways from runoff by creating a vegetated buffer zone at least 6 feet from the shoreline up the bank. Letting the grass grow tall in this zone or replacing turf with low-maintenance native plants will reduce stormwater pollution. Do not use fertilizers, pesticides or any chemicals within 10 feet of the water. Plants in the buffer zone will catch the excess from traditional maintenance practices used in yards in the area. Florida native plants will survive because they are native to Florida and do not need extra help from chemicals.



## Native Plants

*Native plants do not require a lot of maintenance such as the use of fertilizers, pesticides, and irrigation.*

*Minimize the use of high-maintenance plants throughout your yard and plant natives along the shoreline.*

## Hazardous Waste

A substance is considered hazardous if it is flammable, explosive, corrosive, or toxic. Examples include pool chemicals, bleach products, oven cleaner, nail polish, toilet cleaners, pesticides, motor oil, automobile batteries, transmission and brake fluid, paint thinners, paint strippers, stains and finishes, fluorescent bulbs, kerosene, propane tanks, flares, and fire extinguishers.



## Medication Disposal

Please do not flush any medications down the drain or into the toilet. Research shows that even small concentrations of pharmaceuticals can have an adverse impact on people and aquatic organisms including marine life. More than four billion prescriptions are filled in the US every year, and a third of the dispensed medication goes unused.

## Positive Actions

Our counties have approved places to dispose unused or expired medications safely. In Manatee County you can go to Manatee County Sherriff's Operation Center at 600 US Hwy 301 West in Bradenton. In Sarasota County you can go to Sarasota County Sherriff's Offices at 2071 Ringling Blvd. in Sarasota and 4531 State Road 776 in Venice.

- North County at 8750 Bee Ridge Road in Sarasota
- Central County at 4010 Knights Trail Road in Nokomis
- South County at 250 S. Jackson Road in Venice

KEEP SURFACE RUNOFF CLEAN



Bottlenose dolphin

## KEEP SURFACE RUNOFF CLEAN

### Pesticides

Pesticides are helpful in many instances, but unfortunately, their toxic properties do not distinguish between insects that consume plant life and beneficial insects such as ladybugs, spiders, bees, wasps, and caterpillars. Pesticides are also dangerous to people, pets, and the Bay.

### Positive Actions

Please consider non or less-toxic alternatives when selecting pesticide products for your yard. Biologically-based pesticides, such as pheromones and microbial pesticides are becoming increasingly popular and are often safer than chemical pesticides.



*The zebra longwing (Heliconius charitonius) is Florida's official state butterfly. The zebra longwing caterpillar feeds on pollen and flower nectar, they especially enjoy passion flowers. They could be mistaken for a pest, but they are important pollinators.*

### Baby Birds



*These birds eat insects, seeds, berries, nectar, and fruits. They consume millions of insects that otherwise might damage crops and trees of farmers and foresters. Some birds consume as many as 300 insects a day. Baby birds eat exclusively bugs. They perform naturally what pesticides do with harmful chemicals that accumulate in stormwater runoff. But, bugs aren't all bad; they play a critical role in our environment as food, predator, and pollinator.*





*Do you know where it goes?*

*Rainwater can wash those little presents your pooch leaves on the ground into streams and rivers which lead to the Bay, or directly to the Bay itself. Just like human waste, dog waste poses a threat to both public health and water quality.*



## Pooches for the Planet

### Pet Waste

Pet waste contains bacteria that can be harmful to the life and habitat of Sarasota Bay. The problem is the total amount of pet waste deposited in the watershed. It is estimated that 26 tons of dog waste is deposited every day throughout Sarasota and Manatee County. Because of rain and stormwater runoff, some of the bacteria ultimately flows into the tributaries leading into the Bay.

### Positive Actions

#### Please Pick Up After Your Pet

Although flushing pet waste down the toilet is ideal, its not realistic for most people. The best alternative is to bag the waste and trash it in a nearby trash can. You can reuse plastic newspaper bags or grocery bags. Biodegradable bags are also available at most pet supply stores.

#### Spread the Word

Bacteria and nutrient pollution from pet waste can lead to red tide, algae blooms, and beach closings. Spread the word about the harmful impacts of dog poop on our waters to your friends and neighbors and encourage them to join the Pooches for the Planet pack by picking up after their pet!

KEEP SURFACE RUNOFF CLEAN



## KEEP SURFACE RUNOFF CLEAN

### Pools

Swimming pools require large doses of chlorine and other chemicals which should not be dumped directly into the street or any body of water.

### *Positive Actions*

#### To Help Prevent Pool Pollution

- Drain your pool only when necessary and never during water restriction periods.
- Do not chlorinate the pool water for several days before draining it. Chemicals can also be added to neutralize the chlorine and disinfectant chemicals in your pool.
- Drain the pool slowly onto a large expanse of lawn to allow the water to slowly filter through the soil. Never drain directly into a waterway or the street. Contact your local government about pool draining regulations in your area.

#### To Conserve Water and Electricity

- Install a pool cover. As much as 70 percent of a pool's water loss is caused by evaporation. It will also keep your pool or spa cleaner and reduce the need to add chemicals.
- If you heat your pool — reduce your pool's water temperature and the number of months a year you heat your pool. This lower energy use will reduce your carbon footprint and cut your energy bill.
- Shorten the operating time for your swimming pool filter and use the automatic cleaning sweep. In the winter, two hours a day of filtering could cut your filter's energy use by 40 percent to 50 percent, without any noticeable difference in clarity or sanitation.

### *Saltwater Pools*

*While saltwater pools don't require the addition of chlorine, the water still contains chemicals. Saltwater pool owners should take the same precautions as chlorine pool owners. Do not drain either type of pool directly into a waterway or street.*



## Notes on Watering

- ▲ Check for water restrictions visit [www.watermatters.org](http://www.watermatters.org)
- ▲ Do not turn on an automatic sprinkler system to satisfy a few thirsty plants.
- ▲ Hand water plants or install a drip system (micro-irrigation).



## Irrigation

Over-irrigating yards contributes to stormwater pollution since the excess water can transport chemicals, pet waste, and litter into the water system. When water is not utilized by plants it runs off into the street causing runoff without the storm.

## Positive Actions

- Make sure your irrigation system is set to only water plants that need it.
- Direct sprinkler heads away from paved surfaces; especially if drainage is directly into the street or drainage ditch.
- Make sure sprinkler heads are working properly and consider upgrading to micro-irrigation.
- Use rain and soil sensors and automatic shut off devices.
- Know the watering restrictions in your area and when you are allowed to water.
- Arrange your plants in groups with similar watering needs to create watering zones within your irrigation system.

## Yard Debris

Degrading plant matter releases nutrients and any chemical residue on the leaf into the water. Keep grass clippings, leaves, and other yard debris out of stormdrains and away from waterways. Instead reuse yard debris as mulch in your yard. It will save you time and money to leave grass clippings on the grass after you mow, a practice called grass-cycling. You can also reuse oak leaves and pine needles for mulch in plant beds.

KEEP SURFACE RUNOFF CLEAN



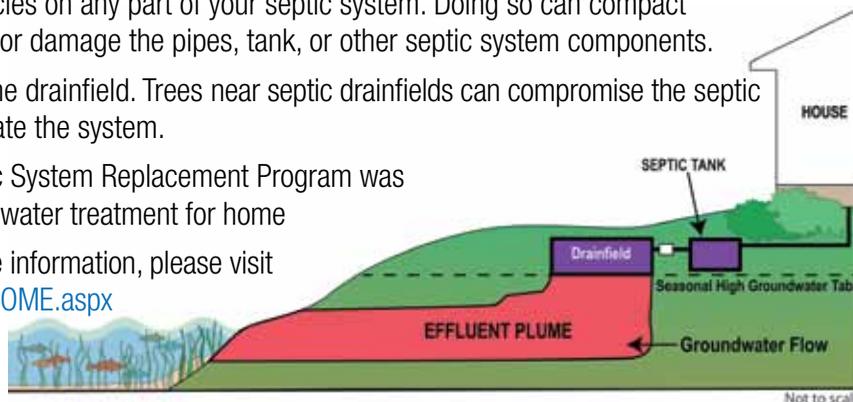
## KEEP SURFACE RUNOFF CLEAN

### Septic Tanks

Failing septic tanks are still a problem in some parts of the Sarasota Bay watershed. Septic tanks that were installed too close to waterways or were not maintained leak bacteria and nutrients from sewage into the groundwater and adjacent waterways.

### Positive Actions

- Know the location and components of your septic system. Have the septic tank inspected by a professional annually for accumulation of sludge and surface scum. If the bottom of the surface scum is within three inches of the tank's outlet pipe, have the septic tank pumped and properly cleaned. Generally, have the sludge pumped every three to five years.
- Do not use septic tank cleaning compounds. They may reduce the tank's efficiency and damage the drain field soil.
- Keep roof drains, and other rainwater or surface water drainage systems away from the drainfield. Flooding the drainfield slows down or stops treatment processes and can cause plumbing fixtures to back up.
- Do not drive or park vehicles on any part of your septic system. Doing so can compact the soil in your drainfield or damage the pipes, tank, or other septic system components.
- Do not plant trees near the drainfield. Trees near septic drainfields can compromise the septic system when roots infiltrate the system.
- The Phillippi Creek Septic System Replacement Program was initiated to improve wastewater treatment for home and businesses. For more information, please visit <http://sewers.scgov.net/HOME.aspx>



*Flushing household chemicals, gasoline, oil, pesticides, antifreeze, and paint can stress or destroy the biological treatment taking place in the system and contaminate surface waters and groundwater.*

*These problems are costly to fix and lead to septic backups in your home and yard. Regular septic tank maintenance by a professional is better for you and the Bay.*



### ***Avoid boating in shallow areas or seagrass beds.***

*If you see a mud trail in your wake then your propeller has churned up the bottom, clouded the water, and likely cut seagrass roots. If you see this trail do not reverse your engine or try to dig out of the flats, instead you should –*

- ▲ *Stop your vessel.*
- ▲ *Tilt your motor out of the water.*
- ▲ *Pole or walk your vessel out of the shallow area or seagrass bed.*



### **Boats**

Even though boating is popular and vital to our economy, boating can also have consequences on the natural environment and survival of aquatic species.

### ***Positive Actions***

- Never dump the sewage tank into the water. Get it pumped properly at a local marina.
- Repair leaks promptly and regularly inspect your vessel for problems. When changing the engine oil, bring the used oil to a marina that recycles oil or a county hazardous waste site. Never dump it into a waterway, storm drain, or ditch.
- When fueling your boat, do not spill fuel or overfill the tank. Wipe away any excess fuel.
- Wash your boat with a mild, biodegradable, low-phosphate soap. Use a bucket of water or a hose with a shutoff nozzle, rather than a constant stream of water.
- When removing the paint off boat hulls, catch the scrapings in a drop cloth, or sweep and throw them away into the trash. Bottom paints contain copper or tin which are extremely toxic to aquatic life.
- Leave at least 12 inches of clearance between your boat propeller and the Bay bottom. Churning up sediments not only causes the water to become cloudy, but also damages the plant habitat for bottom-dwelling animals.
- Always follow posted speed zones, exclusion zones, and channels. These navigation areas and signs are posted to protect wildlife, resources, and the boating public.



## KEEP SURFACE RUNOFF CLEAN

### Marine Debris

Trash on land becomes trash in the water. There are vast stretches of open ocean with floating trash. Marine debris entangles and kills millions of wildlife, from birds to dolphins, every year. Marine debris also damages boat propellers and is a hazard for swimmers and scuba divers. Plastic bags and six-pack rings are particularly harmful to aquatic and bird life.

### Positive Actions

If something flies off your boat or car, turn around and pick it up. Commit to picking up one piece of trash that is not yours from the ground every day. If everyone in Sarasota and Manatee County did that every day for a year, we could remove over 500 million pieces of trash from the ground that would never make it into our waterways. You can volunteer to remove marine debris with your local Keep America Beautiful affiliate.

### Monofilament

Monofilament, also known as fishing line, causes big problems for wildlife in the Sarasota Bay watershed. Birds, fish, seagrasses, and manatees get caught up in this almost invisible thread. Entangled wildlife often starve to death from inability to get food and injury. Both Sarasota and Manatee Counties have monofilament recycling programs where you can dispose of your monofilament responsibly.

If you are fishing and wildlife becomes entangled in your line, do not cut the line. Entangled wildlife may not survive even if they appear fine at the time of release. For entangled marine animals call the Florida Fish and Wildlife Conservation Commission (FWC) at 888.404.3922. For entangled birds call Save our Seabirds, Inc at 941.388.3010.



*If you are interested in obtaining a monofilament recycling bin for your facility in Sarasota County, contact: 941.861.5000*

*Scientists are tracking a man-made island of trash in the central north Pacific Ocean. It is reported to be the size of Texas. The Great Pacific Garbage Patch has high concentrations of pelagic plastics, chemical sludge, and other debris that have been trapped by ocean currents. A similar island of human trash is located in the north Atlantic Ocean.*



## Get Involved

Interaction between civic organizations and the community has resulted in widespread grassroots action to restore and protect the Bay.

Sarasota Bay Estuary Program has motivated the community to take action by offering volunteer opportunities and grants.



## LANDSCAPING CHOICES MATTER

No matter where you live, whether it's miles inland or on the coast, your yard is connected to the bay and gulf through a series of ponds, canals, and creeks. Plant selection is the key to creating a low-maintenance and Bay-friendly yard.

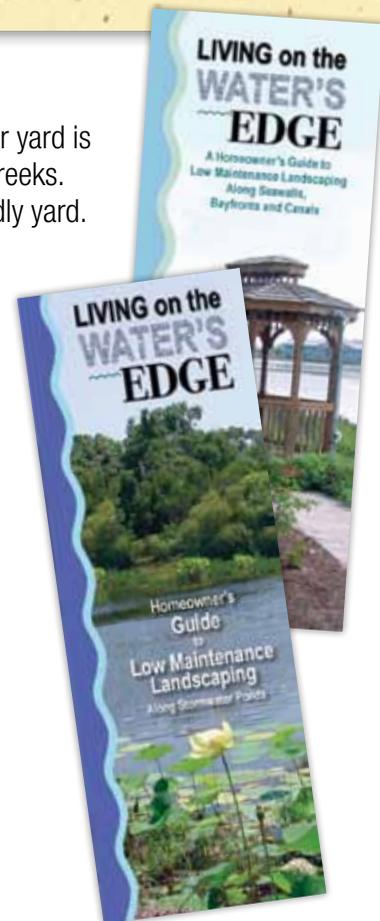
### Low-Maintenance Landscaping

There are many resources that provide information on what to plant whether you are looking for salt tolerant plants or butterfly attractors. Publications like *Living on the Water's Edge* brochures, produced in partnership by Sarasota Bay Estuary Program and Sarasota County, provide landscape examples with a sampling of plants for dry and wet landscapes.

Refer to page eight for Sarasota and Bradenton Counties' *Recommended Fertilizer and Landscape Management Code*.

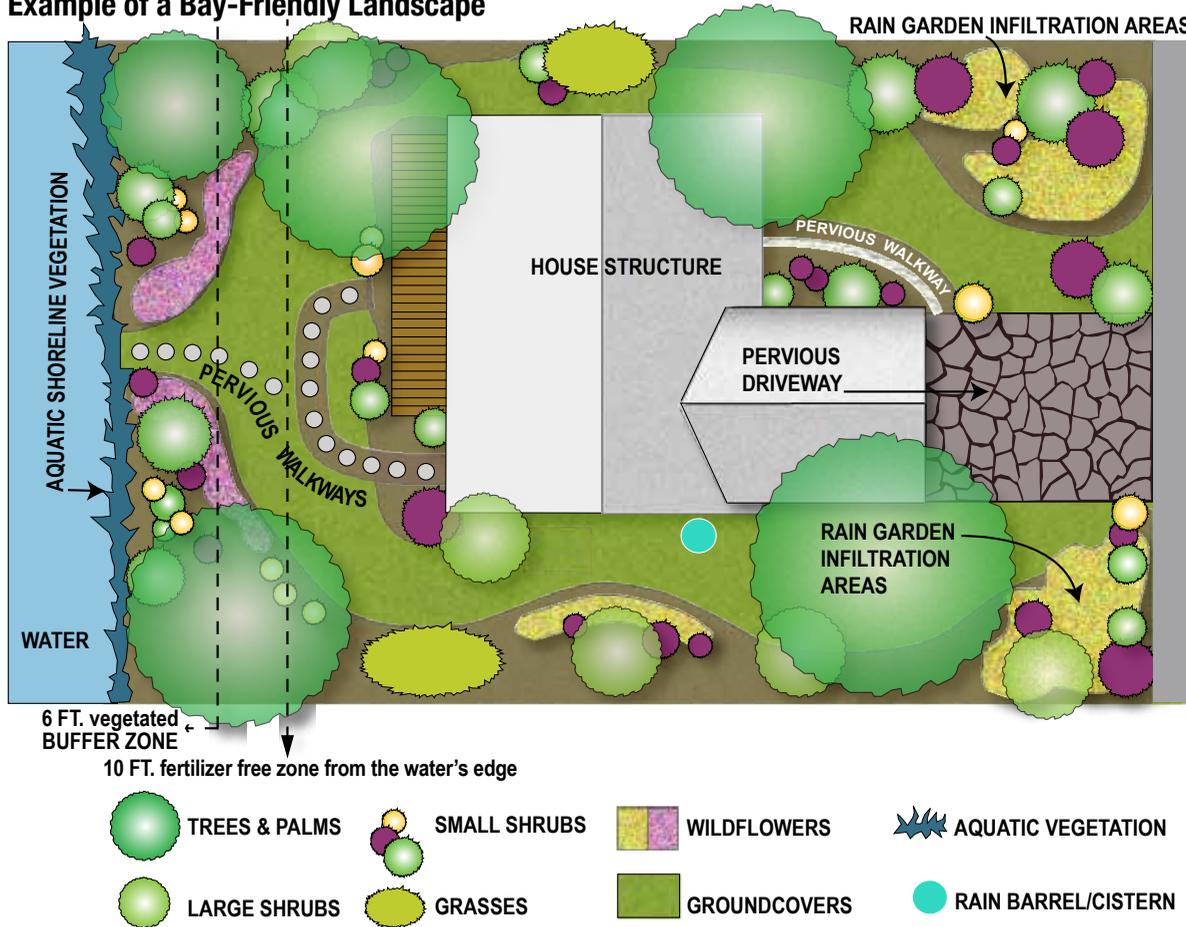


Here are just a few low-maintenance plants:  
(left to right): Blanket flower "Gaillardia pulchella",  
Beautyberry "Callicarpa Americana", Tropical sage "Salvia coccinea".



*Living on the Water's Edge* brochures are available through Sarasota County and are also posted at: [www.sarasotabay.org](http://www.sarasotabay.org)

## Example of a Bay-Friendly Landscape

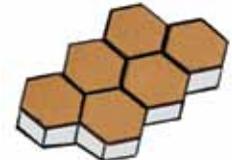


### *Pervious Walkways, Patios, and Driveways*

- ▲ Using materials such as gravel, crushed shell, interlocking tiles, or brick allows water to seep into the ground to help filter out pollutants.
- ▲ Minimize impervious surfaces like concrete and asphalt, which increase stormwater runoff and make runoff super-heated.

### *Find Out What's New!*

There is now pervious concrete that allows water to seep through and meets the Environmental Protection Agency's stormwater regulations.



## Use Rain Water

*Do not let this valuable and scarce resource go to waste! Capture and use rain water.*

*Approximately 50% of the water used in the average Florida household is used outside the home.*

*Direct downspouts into a rain barrel, a rain garden or just the lawn. Never allow downspouts to dump water on driveways, sidewalks or directly into the street. What needs the water more?*

*Your yard or the street?*



# WATER SOLUTIONS

## Rain Barrels

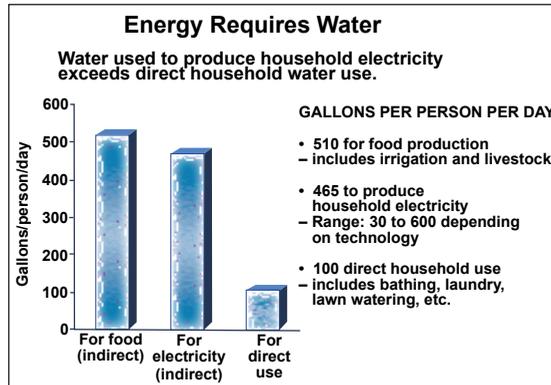
A rain barrel is a system that collects and stores rainwater from your roof.

Rain barrels have been used for centuries to capture rain water. They are ideal for secondary uses such as landscaping.

The barrel can be a stand-alone unit or part of a larger system with multiple connections to downspouts from gutters connected to the roof of a building.

### What are the Advantages of a Rain Barrel?

A single rain barrel can save homeowners up to 1,300 gallons of water during the summer months. Saving water not only helps protect the environment, it also saves homeowners money and energy.



This graph illustrates how much water is used daily to produce electricity in a household. (Source derived from Gleick, P. (2002). *World's Water 2002-2003*. National Renewable Energy Laboratory.)

## The Water/Energy Connection

In the United States, generating power consumes three percent of our nation's water annually and 13 percent of the energy produced in this country each year is used to treat, transport, and heat our water. Conserving water saves energy, and vice versa. The water-energy connection is complex, but can be seen in your own home. For example, reducing the amount of hot water your household uses actually decreases the electric bill.

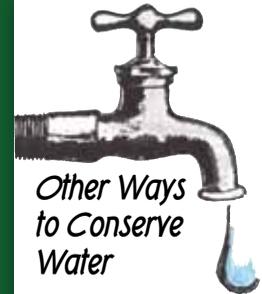
## Cisterns

Cisterns are becoming more popular in commercial buildings and with residential home owners who are committed to water conservation. In residential areas, cisterns provide a higher water-holding capacity than a typical rain barrel. Some cisterns are only used for irrigation due to water quality concerns; however they can be outfitted with filters or other water purification methods when the water is meant for use inside the home.

In the Sarasota Bay region, a cistern can be easily viewed by the public at the Marie Selby Botanical Gardens. Selby's 50,000 gallon cistern catches rain that falls on the greenhouses. The water is then used to irrigate the orchids, bromeliads, and other rare plants in the display house and greenhouses.



*Cistern at Phillippi Creek Mansion, Sarasota County.*



### *Other Ways to Conserve Water*

- ▲ *As much as three gallons per minute can escape each time you allow the water to run while brushing your teeth or shaving. Turn it off when you are not using it!*
- ▲ *Replace conventional shower heads with ultra low-flow models to reduce water flow by as much as 25 percent.*
- ▲ *Check for leaks - monitor your water meter before and after a two hour period in which no water is used. If the readings are not identical, a leak is evident.*

## Do You Know Where the Water Flows?

Put dry loving plants in dry spots and wet loving plants in wet spots. If you have a wet spot in your yard or at the end of a downspout create a rain garden with wetland plants that do not mind getting soggy.



## Rain Gardens

A rain garden is a planted depression that allows rainwater runoff from roofs, driveways, walkways, and compacted lawn areas to be absorbed into the garden. Native plants are recommended for rain gardens because they do not require fertilizer and are more tolerant of our local climate.

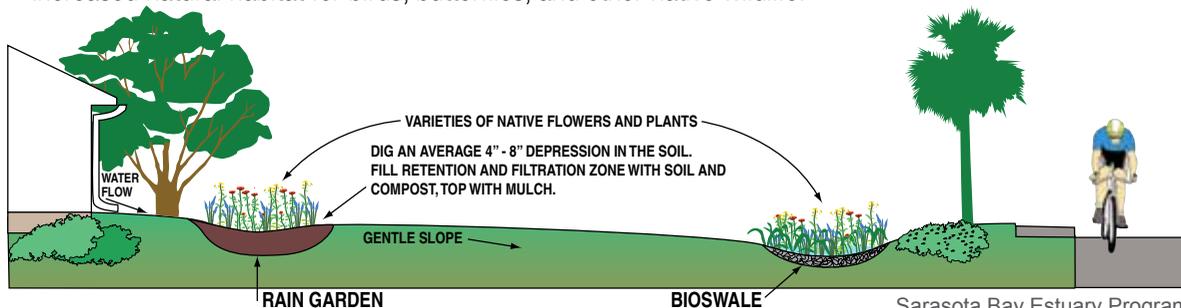
Rain gardens can cut down on the amount of pollution because the runoff water filters through soil layers before entering the groundwater system. Through the process of transpiration, rain garden plants return water vapor into the atmosphere.

## Bioswale

A bioswale is a conventional ditch or swale, modified and planted with appropriate native and bay-friendly plants to increase water percolation and pollutant removal as stormwater flows through it. Like a rain garden it should be planted with a wide range of plants that can survive a combination of being wet or dry for extended periods. A bioswale is not usually mowed but allowed to act as a retention area or flow through filtration garden with periodic hand maintenance as needed to maintain drainage and weed control.

## Benefits of Rain Gardens and Bioswales for People and Nature

- Increased rainwater ground infiltration and reduced stormwater runoff.
- Reduced erosion and flow of stormwater pollutants (fertilizers, pesticides, oils, etc.) into local waterways.
- More attractive landscaping and reduced yard maintenance costs.
- Increased natural habitat for birds, butterflies, and other native wildlife.



## WATER SOLUTIONS

### Green Roof

Green roofs are living, vegetated alternatives to traditional shingle or tile roofs. They are a key solution to our water and energy conservation goals.

#### Benefits

- Cools and humidifies the surrounding air.
- Green roofs create biodiversity and encourage wildlife such as birds, butterflies, and insects to remain within urban areas.
- Green roof vegetation helps to filter dust and smog particles from the air.
- Can reduce stormwater runoff by 50-90%.
- Peak-flow volume is greatly reduced and is delayed by as much as 4 hours, minimizing the impact on existing sewer systems and slowing down stormwater entering streams.
- Green roofs can improve the thermal resistance of the roof assembly throughout the year, especially in summer months by helping to improve insulation and reduce cooling costs.
- A green roof protects the roof structure from climate extremes and physical abuse thereby greatly increasing the life expectancy of the structure.



*Green Roof at Island Park, Sarasota County.*

*Solar panels can reduce your electric bill by hundreds of dollars annually. The costs for these systems have decreased in recent years and many states offer tax credits to encourage their use. Most communities in Florida have local companies specializing in the installation of solar panel systems.*



## *Low-Impact Development (LID) Manual for Sarasota County*

*This manual provides technical guidance and design specifications on LID stormwater management practices. These designs improve overall stormwater management relative to conventional systems, reduce total and peak runoff volumes, and improve the quality of waters. For more info look at the LID Manual at [www.scgov.net](http://www.scgov.net)*



## LANDSCAPING TO SAVE ENERGY

Conventional landscapes require energy intensive, polluting, and expensive maintenance practices due to high demands for irrigation, fertilizers, and frequent mowing. When we make smarter choices for our landscape, we reduce our carbon dioxide and nitrous oxide emissions and preserve the vitality of the communities that we appreciate today for future generations.

***Landscaping to save energy strategies can help to offset the emissions footprint of our everyday activities.***

### ***Positive Actions***

Using climate friendly landscape guidelines reduces the demand for non-renewable resources and improves the water and air quality.

Trees and other vegetation benefit the climate in many ways: human comfort, energy conservation, cooling urban climates, and reducing air pollution.

- **Minimize Mowing**

Mowed lawns require carbon and nitrogen intensive maintenance. Expand plant beds, use groundcovers, and use electric or manual lawn equipment.

- **Incorporate Native Plants**

Native plants are adapted to local conditions and need less carbon and nitrogen intensive maintenance.



*Landscaping to Save Energy brochure is available through Sarasota County and also posted at: [www.sarasotabay.org](http://www.sarasotabay.org)*

- **Reduce Hardened Surfaces**

Driveways and sidewalks heat up quickly and radiate that heat. Break-up these heat islands by reducing hardened surfaces with landscaped beds and trees.

- **Conserve Energy by Conserving Water**

It takes energy to pump, filter, and distribute water. Capture and reuse rainwater with rain barrels, rain gardens, and green roofs.

- **Minimize/Eliminate Fertilizers & Pesticides**

Reduce the use of chemicals in your yard.

- **Reuse Yard Waste**

Recycle carbon and nitrogen back into the soil naturally.

- **Increase Tree Canopy**

Keep mature trees and plant new trees to decrease your carbon footprint.

- **Create Biodiversity**

Plants absorb more carbon and nitrogen than mowed lawns. Diverse plantings also attract birds and butterflies!

- **Naturalize the Shoreline**

Plant native vegetation to buffer against storm surge and rising sea levels. Remove seawalls.

- **Engage Your Neighborhood**

One person can make a difference. But more people can make an even bigger difference!



## *According to the EPA-*

- ▲ *A power push mower emits as much pollution in an hour as 11 cars.*
- ▲ *A riding mower emits as much pollution in an hour as 34 cars.*
- ▲ *Native plants work much better than traditional mowed grass as a carbon sink due to their extensive root systems and increased ability to retain and store water.*
- ▲ *Annual U.S. nitrous oxide emissions began rising sharply from 2003 to 2006, largely as a result of increases in the application of synthetic fertilizers.*

*The pleasure of waterfront property comes with the responsibility to protect that water body.*

*Choosing the appropriate landscaping is not only beautiful but helps keep Sarasota Bay healthy.*



## CREATING LIVING SHORELINES

A recent mapping project showed that the Sarasota Bay watershed has more than 100 miles of seawalls and other hardened shorelines. Creating “living shorelines” is a more eco-friendly alternative to seawalls. Living shorelines use native plants, sand, and rock to reinforce the shoreline, minimize erosion, and maintain coastal processes while providing valuable habitat for the wildlife of Sarasota Bay.



### *Positive Actions*

- Protect the natural slope and shoreline vegetation such as mangroves and native shoregrasses. This improves water quality by filtering runoff and preserves habitat for aquatic flora and fauna.
- Gradually remove invasive plants such as Australian pine and Brazilian peppertree. Replace them with native vegetation appropriate for your area, whether you are on the coast or inland. Many invasive species take over more desirable native species that stabilize the shoreline and provide other valuable biological services.
- When planning your dock, design the access ramp and main platform to take up the smallest possible area. Consult your local county planning department for permits and sensitive environmental concerns. Avoid damaging seagrasses and mangroves.
- Rip rap or rock revetments can be designed to provide space for mangroves and marsh grass to be planted or take root naturally. Discuss this option with your engineering contractor.
- If you have a seawall, make sure you maintain the structure. In Florida, a properly-maintained seawall can last between 20 and 30 years.

## Mangrove Trimming

Mangroves are a tropical plant adapted to loose, wet soils, salt water, and occasional submersion by tides. They are vital to Sarasota Bay and all of the area's ecosystems. They provide habitat for numerous fish and bird species, help prevent erosion, filter water to enhance quality, and serve as a buffer for major storms.

Mangroves are protected by the State of Florida. It is a violation of state law to remove mangroves or even trim them without a permit. Even though it is legal to trim mangroves to six feet with a permit, this may have an adverse impact on their value to habitat. One creative solution is to let mangroves grow to their full height and cut "windows" in the canopy at select spots to preserve the view.

**Red mangroves** are closest to the water and are easily identified by their long seed pods, or propagules, and tangled reddish roots that branch out over the water.

**Black mangroves** have short root-like projections, or pneumatophores, that project upwards from the underground roots and provide oxygen to the tree.

**White mangroves** are found farther from the water than the red or black mangroves, and are distinguished by a broad rounded leaf with a notch in the tip and two small "bumps" or salt glands on opposite sides at the base of the leaf stem.

**Mangroves are protected.**  
**For information and contacts for permits refer to pages 30 and 31.**



*Red mangrove prop roots*

*Florida's estimated 469,000 acres of mangrove forests contribute to the overall health of the state's coastal zone. Worldwide, more than 50 species of mangroves exist. The red mangrove's prop roots have earned the plant the title, "walking trees" since the mangrove appears to be standing or walking on the surface of the water.*



## Some Basic Ingredients

**Baking soda** – An all-purpose, non-toxic cleaner. Cleans, deodorizes, removes stains and softens fabrics.

**Borax** – A natural mineral that kills mold and bacteria as well as repels household insect pest. An alternative to bleach, it deodorizes and removes stains.

**Castile & vegetable oil-based soaps** – Cleans everything.

**Lemon juice** – Cuts through grease, removes perspiration and other stains from clothing. A bleach alternative.

**Salt** – Coarse-grained. Use as an abrasive. Good for pots, pans and hard surface stains.

**Vinegar** – (White) low-grade acid cuts grease, removes stains and is an excellent water softener.



## BAY-FRIENDLY CLEANING

Use the recipes listed below when making alternative cleaners at home. Most are inexpensive and you probably already have many of the ingredients in your kitchen cupboards. Used individually or combined, these cleaners are safe, effective, and cost-efficient.

### Recipes for Non-toxic Cleaning Alternatives

Add your favorite essential oils or herbs to any of these formulas for fragrance.

#### Household Cleaner:

1 tsp. liquid soap (castile, peppermint)  
1 tsp. borax, squeeze of lemon,  
1 qt. warm water

OR: 1/4 c. baking soda,  
1/2 c. borax, 1/2 c. vinegar,  
1 gal. water

#### Window Cleaner:

2 tsp. vinegar, 1 qt. warm water.  
OR: 2 tbsp. borax, 3 c. water.

OR: club soda in a spray bottle.

#### Toilet Bowls:

Pour: 1/4 c. baking soda into bowl and drizzle with a small amount of vinegar. Let sit for 1/2 hour. Scrub and flush. Add borax for stains.

#### Oven Cleaner:

1/4 c. baking soda,  
2 tbsp. salt,

Hot water, as needed to make a paste. Let paste sit for 5 minutes.  
Caution: Keep off wires/heating elements.

OR: 2 tbsp. liquid soap (castile, peppermint), 2 tsp. borax, 1 qt. warm water. Spray on oven and wait 20 minutes, then clean. For tough stains, scrub with very fine steel wool and baking soda.

#### Carpet Deodorizer:

Sprinkle borax directly onto carpet. Leave for at least 30 minutes and vacuum up.

#### Mildew Remover:

Dissolve together: 1/2 c. vinegar, 1/2 c. borax in warm water. Apply with sponge or spray bottle.

## Air Fresheners:

Commercial fresheners work by masking smells, coating nasal passages, and deadening nerves to diminish sense of smell. Instead, find source of odors and eliminate them. Keep house and closets clean and well-ventilated. Grow lots of house plants which naturally clean the air.

To absorb odors, place 2 to 4 tbsp. baking soda or vinegar in small bowls in refrigerator and around the house and pour 1/2 c. baking soda in the bottom of trash cans.

## Ceramic Tiles:

1/2 c. white vinegar  
1/2 c. water  
few drops favorite essential oil.

## Basin, Tub, and Tile:

1/2 c. baking soda, 2-3 tbsp.  
liquid soap (castile, peppermint)

## Drain Cleaner:

Pour together: 1/2 c. borax in drain followed by 2 c. boiling water.  
OR: 1/4 c. baking soda down the drain, followed by 1/2 c. vinegar.  
Cover drain and let sit for 15 minutes. Follow with 2 qts. boiling water.  
OR: Use a plumber's "snake" and boiling water.

## Garbage Disposal Freshener:

Pour lemon or orange juice in the disposal.

## Furniture Polish (Wood Surfaces):

Rub toothpaste on wood furniture to remove water marks. Polish wood with 2 tsp. lemon oil and 1 pint mineral oil in spray bottle. Spray, rub in and wipe clean. Mix two parts olive oil to one part lemon juice. After rubbing the mixture in, let stand for several hours and then polish with a soft, dry cloth. Melt 1 tbsp. carnauba wax into two pints mineral oil. Use sparingly and rub hard.



## Hints

To save time and money, make large batches of the recipes and store them in reusable airtight plastic containers and spray bottles. Using a pretty spray bottle or container makes cleaning days more fun and pleasant.

Label all of your cleaners and keep a list of ingredients. Keep them out of reach of children. While most of these all natural cleaners are not poisonous, some can be harmful if swallowed by children or pets.



## *It's the Law —*

*If you are considering doing any work along any water edge, consult the appropriate county Coastal Zoning Department during the early planning stages.*



# PROJECTS REQUIRING COUNTY COASTAL PERMITS OR VARIANCES

## Guidelines

### General Permits:

- Replacement or repair of existing structures, such as docks, in the same location and of the same size/configuration.

### Minor Work Permits:

- Construction of new docks and piers.
- Shoreline alterations, including construction of rock, revetments, retaining walls, or sea walls.
- Maintenance dredging.

### Major Work Permits:

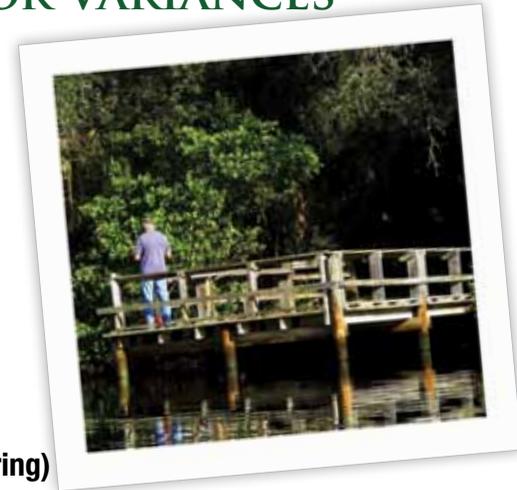
**(reviewed by the County Commission at a public hearing)**

- A Major Work Permit is required for any activity that does not meet the criteria for a General or Minor Work Permit.

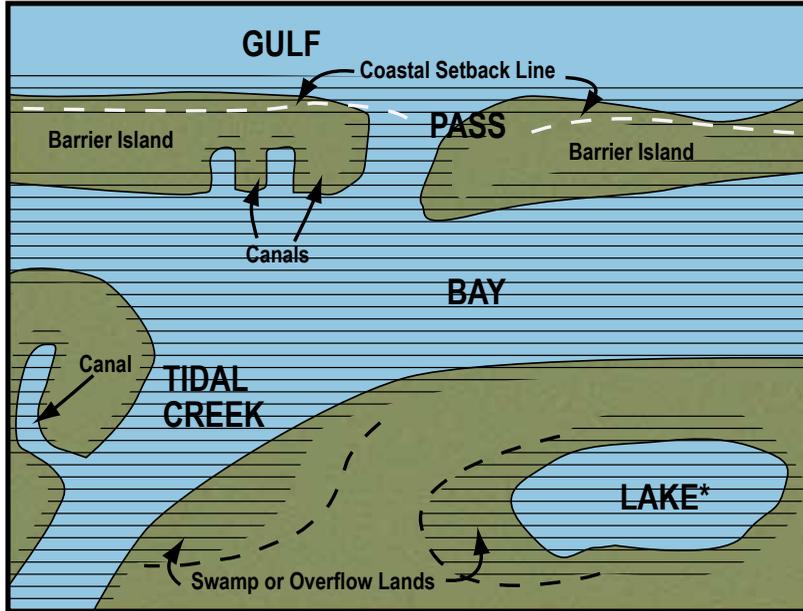
### Coastal Setback Variances:

**(reviewed by the County Commission at a public hearing)**

- In areas seaward of the county Gulf Beach Setback Line (GBSL) or the Barrier Island Pass Twenty-year Hazard Line (PHL).
- Any excavation or earthmoving.
- Any alteration of native vegetation or habitats.



**PROJECTS PROPOSED THAT ARE IN THE HATCH-LINE AREAS  
GENERALLY REQUIRE A COASTAL PERMIT OR VARIANCE.**



**If you are considering doing any work along any water edge, consult the appropriate county Coastal Zoning Department during the early planning stages:**

**Manatee County**  
Manatee County Planning and Development Department  
212 6th Avenue East  
Bradenton, Florida 34231  
941.749.3070

[www.mymanatee.org](http://www.mymanatee.org)  
-click on Permitting

**Sarasota County**  
Sarasota County Natural Resources  
1301 Cattlemen Road,  
Building D  
Sarasota, Florida 34232  
941.861.5000  
[www.scgov.net](http://www.scgov.net)

**Mangroves and Permits**

*Mangroves are native trees that grow on the water's edge. They have special ecological value as shoreline stabilizers, nutrient recyclers, and marine life protectors.*

*Because mangrove trees are so vital to the health of our bays, an army of regulations protect them. Federal, state, and county governments limit their removal and trimming, and permits must be obtained before work has begun.*

*Be smart – check with your local county permitting department before cutting any mangrove branch.*

*Mangrove trimming and alteration is regulated by –*

*Florida Dept. of Environmental Protection, not the County. (FDEP ) Southwest District  
13051 N. Telecom Parkway  
Temple Terrace, FL 33637  
Phone. 813.632.7600*

## Summary

### Keep Runoff Clean –

- ▲ *Dispose of hazardous waste properly.*
- ▲ *Do not litter.*
- ▲ *Minimize fertilizer and pesticide use.*
- ▲ *Abide by the Fertilizer and Landscape Management Code.*
- ▲ *Pick up your pet's waste and dispose of it properly.*
- ▲ *Maintain your pool and septic tank system.*
- ▲ *Irrigate efficiently.*
- ▲ *Be sensitive to aquatic plant and animal life while using and maintaining your boat.*



## OTHER AGENCIES TO CONTACT

### Audubon Coastal Islands Sanctuaries

813.623.6826  
[www.fl.audubon.org](http://www.fl.audubon.org)

### Association of Native Plant Nurseries

877.352.2366  
[www.afnn.org](http://www.afnn.org)

### Florida Agriculture and Consumer Services

**Division of Aquaculture**  
For more information on shellfish harvesting.  
850.488.5471  
[www.floridaaquaculture.com](http://www.floridaaquaculture.com)

### Florida Fish and Wildlife

**Conservation Commission Law Enforcement**  
1.888.404.3922 (FWCC)  
[www.myfwc.com](http://www.myfwc.com)

Manatee and marine turtle collision hotline; rescue and recovery. Also for reporting oil spills, fishing violations, boating accidents, and marine mammal injuries or strandings. Information also available on saltwater fishing and shellfish harvesting.

### Florida Fishing Licenses

888.347.4356  
[www.wildlifelicense.com](http://www.wildlifelicense.com)

### Florida Dept. of Environmental Protection

**Terra Ceia Aquatic Preserve**  
Mangrove Trimming  
941.721.2068 813.632.7600

### Florida Department of Environmental Protection

**Office of Greenways & Trails**  
850.245.2052  
[www.dep.state.fl.us](http://www.dep.state.fl.us)

### Florida Native Plant Society

321.271.6702  
[www.fnps.org](http://www.fnps.org)

### Florida Sea Grant Extension

941.722.4524  
[www.flseagrant.org](http://www.flseagrant.org)

### Florida Wildflower Foundation

407.353.6164  
[www.floridawildflowercouncil.org](http://www.floridawildflowercouncil.org)

### Florida Yards & Neighborhoods

941.861.5000  
[www.FloridaYards.org](http://www.FloridaYards.org)

### Manatee County Government

<b>Marine Rescue</b>	941.749.3500
<b>Conservation Lands Mgmt. Dept.</b>	941.745.3723
<b>Parks &amp; Recreation Dept.</b>	941.742.5923
<b>Lake Manatee Dam/Water Treatment</b>	941.746.3020

[www.mymanatee.org](http://www.mymanatee.org)

### Manatee County Natural Resource Department

**Environmental Protection Division**  
415 10th St W., Bradenton, FL 34205  
941.748.4501 ext. 4602

### Mote Marine Laboratory and Aquarium

941.388.4441  
For assistance with injured marine mammals or sea turtles.  
[www.mote.org](http://www.mote.org)

### National Marine Fisheries Service

727.570.5301  
[www.nmfs.noaa.gov](http://www.nmfs.noaa.gov)

## NOAA Weather Service Broadcast

813.645.2323  
(24 hour weather and marine forecast) 162.55Kz/VH  
[www.noaa.gov](http://www.noaa.gov)

## Sarasota County Government Call Center:

941.861.5000 to be connected to all departments  
[www.scgov.net](http://www.scgov.net)

## Sarasota County Natural Resource Department

1301 Cattlemen Road, Sarasota 34232  
Mailing address: P.O. Box 8, Sarasota, FL 34230  
941.861.5000  
[www.scgov.net/environmentalservices/NaturalResources](http://www.scgov.net/environmentalservices/NaturalResources)

## Sarasota Bay Estuary Program

941.955.8085  
[www.sarasotabay.org](http://www.sarasotabay.org)

## Sarasota County NEST

941.861.5000  
[www.scgov.net/nest](http://www.scgov.net/nest)

## Save Our Seabirds, Inc.

941.388.3010  
[www.saveourseabirds.org](http://www.saveourseabirds.org)

## Science and Environment Council of Sarasota County

941.955.9089  
[www.secsc.org](http://www.secsc.org)

## Sheriff's Office

(Non-emergency. Report crime or incident)  
941.747.3011 (Manatee)  
941.861.5800 (Sarasota)

## Southwest Florida Water Management District

800.423.1476  
[www.watermatters.org](http://www.watermatters.org)

## UF/IFAS Sarasota County Extension Service

941.861.5000  
<http://sarasota.extension.ufl.edu>

## U.S. Coast Guard Rescue

941.794.1261 or 941.794.1607  
For search and rescue assistance VHF Channel 16; Emergency Cell \*CG.  
[www.uscg.mil](http://www.uscg.mil)

## West Coast Inland Navigation District

941.485.9402 For information on the Gulf Intracoastal Waterway.  
[www.wcind.net](http://www.wcind.net)

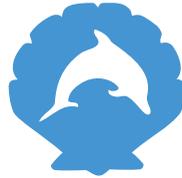
## Summary

- ▲ *Maintain or restore the native vegetation and natural slope of the shoreline.*
- ▲ *Revegetate with native plants.*
- ▲ *Remove coastal structures, such as seawalls, retaining walls, and rock revetments where possible.*
- ▲ *Gradually remove non-native plants such as Australian pine and Brazilian pepper and replace them with native vegetation.*



Sarasota Bay Estuary Program acknowledges all the organizations that provided information and images to help produce this publication.

Brochure design by Patti Cross ([patticross91@gmail.com](mailto:patticross91@gmail.com))



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**ESTUARY PROGRAM**  
*Restoring Our Bays*

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