



St. Johns River Water Management District

# Understanding stormwater systems

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Simply put, a stormwater system is a tool for managing the runoff from rainfall. When rainwater lands on rooftops, parking lots, streets, driveways and other surfaces that water cannot easily go through, the runoff (called stormwater runoff) flows into grates, swales or ditches located around your neighborhood. These grates, swales and ditches convey the runoff into your stormwater pond. A stormwater pond is specifically designed to help prevent flooding and remove pollutants from the water before it can drain into the groundwater — our main source of drinking water — or into streams, rivers, lakes, wetlands, estuaries/lagoons or the ocean. Your stormwater pond might be located near your backyard, down the street or on nearby property.

Without a stormwater system, the stormwater runoff usually flows into the nearest waterbody without treatment. The runoff carries pollutants such as litter, motor oil, gasoline, fertilizers, pesticides, pet wastes, sediments and anything else that can float, dissolve or be swept away by moving water.

## History of stormwater systems

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Wetlands are Florida's original stormwater systems and once covered more than half the state. Wetlands are extremely valuable resources because they:

- Control flooding. Because wetlands are at a low elevation in the landscape, they act as water storage areas that can retain and absorb excess rain water following a storm event.
- Serve as habitat for a variety of plants and animals. Many endangered plant and animal species depend on wetlands for their survival.
- Improve water quality. Wetlands slow down the flow of water and absorb pollutants, storing them, breaking them down and in some cases even using them as nutrients.

People once misunderstood the true value of wetlands, leading to more than one-half of our original wetlands being drained for other uses. As more wetlands were filled, stormwater runoff became the primary source

of pollution to surface water in Florida. In the early 1980s, the Florida Legislature passed laws requiring treatment of stormwater.

## How stormwater systems work

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Stormwater systems come in a variety of shapes, sizes and forms, but basically there are two types, retention and detention.

### Retention system

A retention system is designed to retain runoff and allow the water to seep through soil into the shallow groundwater aquifer. A system can be constructed or it can be a natural depression. Grass stabilizes basin slopes and filters sediments. Retention systems are constructed so that stormwater percolates into the ground without direct discharge to natural surface waterbodies.

A swale is a linear retention system. It is either a constructed or natural area shaped to allow water to be quickly absorbed into the ground or to allow the water to flow to other waterbodies. As in a shallow ditch, a swale promotes water absorption through soils. Swales hold water during and immediately after a storm, but they are generally dry.

### Detention system

Detention systems (ponds) are the most recognizable stormwater system. They are designed to allow pollutants to settle and be absorbed. After a storm, water slowly drains from the pond through a pipe in the “outflow” structure. Part of the pond, known as the permanent pool, is always below the level of the discharge device in the structure. Constructed detention systems (ponds) may have aquatic plants around the perimeter or as a floating disc near the outflow structure to help filter sediment in stormwater runoff. The owner/operation and maintenance entity of the pond should refer to the permit for exact specifications.



Dry retention

Because retention and detention systems were designed to imitate natural processes, individuals may have stormwater systems on or near their property without realizing it. What appears to be a natural indentation in the backyard may have been designed as a stormwater swale. What looks like a wild patch of shrubbery may be an important vegetative buffer around a pond.

## Responsibility for stormwater systems

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In Florida, the responsibility for permitting most stormwater systems rests with the water management districts. After developers complete construction of permitted systems in residential areas, the permit and the legal responsibility for maintaining these systems are typically passed on to a homeowners or condominium owners association, or property management companies.

It is then that the upkeep and maintenance of the system becomes the responsibility of the association, not the developers. The association is responsible for labor and expenses for keeping the system functional and operating as it was designed. This responsibility applies to every homeowner and property owner in the neighborhood, even if they do not live adjacent

to a detention or retention system, as everyone's stormwater flows into the system.

Copies of your association's operation and maintenance permit, plans and maintenance guidelines were provided at the time of the transfer of the permit to your association's representative. For more specific information about your pond, you may call the St. Johns River Water Management District's stormwater permitting staff.

Contact info for each of our service centers and the areas they serve can be found at [www.sjrwmd.com/permitting/contacts](http://www.sjrwmd.com/permitting/contacts).

## Preventing water pollution

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You can help conserve and improve the quality of water that enters the stormwater ponds and promote a healthy environment within your community by following the advice provided below.

### Stormwater system maintenance

If properly maintained, stormwater ponds help prevent flooding and filter out pollutants before they reach streams, rivers, lakes, wetlands, groundwater, estuaries/lagoons and, ultimately, the ocean. The following are a few basic maintenance guidelines that can help keep your stormwater system functioning properly:

- Clear or clean inflow/outflow structures.
- Remove nuisance and excess vegetation.
- Repair eroded slopes.
- Clean up trash and yard waste in your yard and gutters and around storm drains.

### Florida-Friendly Landscaping™

- Apply Florida-Friendly Landscaping™ principles to your landscape, which can conserve water and reduce pollution of water resources. By knowing your plants' soils and water needs, you can significantly reduce the amount of water used for

irrigation, chemicals used for pest control and fertilizers used for growth.

Information on Florida-Friendly Landscaping™ can be found on the district's website at [www.sjrwmd.com/water-conservation/waterwise-landscaping](http://www.sjrwmd.com/water-conservation/waterwise-landscaping), on the website of the Southwest Florida Water Management District at [www.swfwmd.state.fl.us/yards](http://www.swfwmd.state.fl.us/yards), or on the University of Florida's website at [FloridaYards.org](http://FloridaYards.org).

### Chemical use on landscapes

- Use nontoxic chemical alternatives whenever possible and pull weeds by hand.
- Avoid overuse of fertilizers, especially near the water's edge. Rain and lawn watering can wash excess fertilizer into waterbodies where excess nutrients cause algal blooms (green pond scum) and undesirable weed growth. The University of Florida's Institute of Food and Agricultural Sciences recommends using fertilizers with a high percentage of slow-release nitrogen. A higher percentage of slow-release nutrients reduces the chance of nutrients reaching Florida's waterbodies. Proper fertilizer application can result in less mowing, less thatch buildup, less irrigation, fewer nutrients washing into ponds and waterbodies, and fewer insect and disease problems.
- Use only herbicides labeled for aquatic use when maintaining stormwater ponds. Herbicides not labeled for aquatic use may harm fish and other





aquatic life, and their application to aquatic sites is prohibited by state and federal law.

- Wait until grass is actively growing to apply fertilizer. Fertilizer applied when grass is not growing wastes your money and time and can contaminate your water.
- If fertilizer is spilled on the lawn or on the sidewalk or pavement, sweep it up as thoroughly as possible and put it back in the bag.

### **Additional tips for preventing water pollution**

- Never dump oils and other chemicals from your home directly into stormwater drains, which are direct conduits to your stormwater pond or natural water body. Contact your local government's waste management department for a list of disposal facilities.
- Keep vehicles tuned up and in good operating condition. Check for drips and repair leaks immediately to keep nuisance oils off pavement.
- Buy low- or no-phosphate cleaners and detergents. Phosphates act as a fertilizer and increase algae and aquatic weeds in stormwater ponds. When these plants die, they rob the water of oxygen and fish may die.
- Wash your vehicles, bicycles and home equipment on the lawn, where soapy water can't quickly run toward the nearest storm drain, picking up other pollutants as it goes. Wash your car with nontoxic, low-phosphate soap and use water sparingly.
- Sweep walks and driveways instead of hosing them down.
- Clean up pet wastes from which nutrients and bacteria can enter the stormwater drains and contaminate the water system.



- Avoid cutting your lawn too short, which reduces its effectiveness in capturing runoff. Leaving it taller will help it to survive dry periods.
- Never deposit lawn clippings in water bodies and storm drains as this can increase oxygen demand in the water, which can significantly harm fish populations. Use lawn clippings for mulch or compost.
- Do not fill stormwater ponds, swales and retention systems because this can cause flooding and endanger water bodies. Stormwater systems are designed and constructed to an appropriate size. Any reduction in treatment volume will interfere with the pond's ability to hold stormwater runoff.
- Changing the elevation of large pieces of property can have drastic impacts on where stormwater flows. Consult the stipulations of your neighborhood's permit before any construction.

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