NORTH CAROLINA AQUARIUM AT PINE KNOLL SHORES

Cistern Fact Sheet

Why a Cistern?
By diverting potentially harmful stormwater runoff into uses that otherwise would require water from the municipal supply, a rainwater cistern serves conservation twice. Situated near our boardwalk, the Aquarium's cisterns promote conservation education by demonstrating stormwater runoff abatement, and conservation of municipal water.

What Are Stormwater Runoff Impacts?
Under natural conditions, about 10 percent of rainfall runs off the landscape into waterways. The rest evaporates, infiltrates into the ground or is transpired by plants. As we alter the landscape through development and other disturbances, runoff increases and loads pollutants into surface waters. About 90 percent of these pollutants enter the water in the "first flush" of rainfall – about one inch. Shellfish closures are so prevalent after a heavy rain because pollutants that have been accumulating on dry surfaces are suddenly loaded into surface waters in large volumes.

Why Conserve Municipal Water?
Since 2006, North Carolina has been experiencing drought conditions. Our municipal water supply comes from a groundwater aquifer that depends upon rainfall to recharge it. By capturing and using rainfall that would otherwise be lost to runoff, we conserve groundwater.

Are Cisterns Something New?
No! People have collected and used rainwater since ancient times. On the Outer Banks, cisterns were used well into the 20th century. Locally, you can view examples of above-ground and below-ground cisterns at Fort Macon. Cisterns are regaining popularity as a money-saving and landscape conservation feature.

What Did the Aquarium Install?
Our system has a capacity of 18,000 gallons, held in six tanks, and serves a total roof drain area of 17,055 square feet. During a "first flush" rain, our system will collect 15,946 gallons of water, nearly filling it to capacity!

How Do We Use The Water?
We began with "non-essential" uses such as irrigation of the greenhouse, plant nursery and exhibit plants and for maintenance activities such as washing decks and vehicles. Uses eventually will be expanded to exhibit tanks, sculpture pool, waterfall and dock.

PO Box 580 Atlantic Beach, NC 28512-0580 ● (252) 247-4003 ● Fax (252) 247-0663

What If the System Runs Dry or Overflows?
If the tanks run dry, municipal water will be used where necessary. But the likelihood of that is minimal, as the collection and storage system is highly efficient. A 10,000-gallon system has been in place at the North Carolina Aquarium on Roanoke Island through two of the worst years of the statewide drought, and ran dry only once. If our system overflows, excess water is directed into our rain gardens.

What's a Rain Garden?
A rain garden is a wet-adapted landscape area that receives, takes up and infiltrates stormwater naturally. We have installed water-loving plants – including grasses, wildflowers, palms and shrubs – in shallow depressions or on the downward slope of the landscape, in the path of natural sheet flow. The garden was designed for year-round bloom to make it attractive, as well as functional.

What Can I Do at My Home or Business?
You can install a system like this on a smaller scale. A "rain barrel" is a small, home-scale cistern that can be used to collect water from one or more downspouts. Or you can skip the collection system and still reduce runoff and use the water by directing downspouts to water-loving areas of your landscape.

A rain garden can be used alone or in conjunction with a collection system. Rain gardens used alone can be strategically located to catch the runoff from driveways or downspouts or can enhance existing swales built to accept runoff. Any spot in your yard where water tends to pond after a hard rain would be an excellent site for a rain garden. Rain gardens have the added advantages of reducing turf, enhancing the appearance of your landscape and attracting wildlife, depending on the plants you choose.

How Much Will It Cost?
A large commercial system like the Aquarium's costs thousands of dollars. But you can install a small, 60- to 80-gallon home rain barrel system easily for $200-$300. Rain gardens can be installed in one day. The primary expenses are for the bedding material and plants.

Where Can I Get More Information?
Your local extension office can provide you with the materials and technical assistance needed to design your rain barrel and rain garden systems, or visit these websites:
www.ncaquariums.com
www.bae.ncsu.edu/topic/raingarden/
www.bae.ncsu.edu/topic/waterharvesting/
www.stormwatersmart.org
www.lowimpactdevelopment.org

PO Box 580 Atlantic Beach, NC 28512-0580 ● (252) 247-4003 ● Fax (252) 247-0663