Rain Barrels

In a Nutshell

A rain barrel is a device that captures and stores rainwater for later use. Typically designed for homeowner use, rain barrels can be used by communities and corporations, although the use of cisterns is typically more common for applications greater than a single household. Rain barrels are available in a variety of sizes and complexity and are the most common method of rainwater harvesting used by homeowners.

The “How To”

Basic Summary of a Rain Barrel

According to the Missouri Botanical Garden's RainScaping Guide, a rain barrel is simply a barrel that has been formatted with a top spigot, for overflow, and a bottom spigot, to use the collected water. Rain barrels are very similar to cisterns, but the latter are much bigger. The rain barrel should be placed beneath a gutter downspout and should have a screen to prevent leaves, bugs, and other items from getting inside. The rain barrel should be elevated off the ground and should have a hose connected to the overflow spigot that will direct the water when the rain barrel is full. A single home can have many rain barrels, since each rain barrel is fed by only one downspout.

Benefits of a Rain Barrel

According to the Environmental Protection Agency, a rain barrel is usually made from a 55-gallon drum and can save most homeowners about 1,300 gallons of water during the peak summer months. Aside from water conservation, some additional benefits of using a rain barrel include:

- Saves money and decreases electricity usage
- Collection and storage of otherwise wasted rainwater
- Rainwater does not contain calcium, chlorine, or lime which makes it ideal for gardens, flower pots, and car and window washing
- Decreases stormwater runoff and erosion
- Consistent supply of free, fresh, and clean water for outdoor use
- Decreases demand on potable water sources
- Replenishes groundwater supply
- Teaches water conservation techniques and practices

Installing Your Rain Barrel

Pre-built rain barrels can be found at almost any hardware store or nursery and offer an easy installation process. However, rain barrels can also be a somewhat easy DIY project. Before you build your rain barrel, you should evaluate your location and find a flat area beneath or adjacent to the gutter downspout. Building and installing your own rain barrel is not a very difficult process, but proper planning must be done for maximum efficiency.

Basic Rain Barrel Creation Steps

- Inflow - The inflow is the point of entry for the rain into the drum. The hole for the inflow should be large enough to allow the passage of water from a rain event, but narrow enough to snugly fit the downspout. If the top of a rain barrel is open, a screen should be used to prevent access to debris and mosquitoes.
- Spigot - To use the water collected by the rain barrel, an outlet will need to be fashioned. A regular spigot can be affixed to the outlet hole to enable the connection of hoses. The outlet should be located near the bottom of the rain barrel so that water will flow out from the effect of gravity alone.
- Overflow - Since the rain barrel will store a finite amount of water, the size of the rain barrel should be calculated based on the typical rain event and the area of the collection surface (the roof, for example). However, sizing a rain barrel too large will waste capacity. For those events that release more rain than the rain barrel can store, an overflow valve will need to be added to the barrel. This overflow should be located near the top of the rain barrel so that excess water can be released in a controlled manner.
- Down Spout Modification - Once the rain barrel is complete, it will need to be connected to the existing gutter downspout. Water is very heavy. At 70 degrees Fahrenheit, one gallon of water weighs over 8 pounds. A 55-gallon rain barrel full of water will weigh over 450 pounds. Thus, while the rain barrel should be located near a down spout, it should also be placed on a sturdy surface that can handle the weight of full rain barrel. To connect the rain barrel, cut the down spout at a level above the top of the rain barrel and attach a section of pipe to the bottom of the down spout and the top of the rain barrel. Seal the connections to prevent the entry of debris and mosquitoes into the rain barrel.

Maintaining Your Rain Barrel

Maintaining your rain barrel is not difficult but a few steps should be taken in order to maximize the efficiency and effectiveness of the system. The suggestions below not only reflect actions toward the rain barrel itself, but to the entire system.

- Clean gutters twice a year, or more if you have trees
- Make sure gutters are tilted to direct flow and that any low or sagging spots are fixed
- Make sure the roof shingles and flashing direct the water into the gutter
- Make sure all parts are securely fastened together
- Check and clean out rain barrel at least once per year
- Check and clean out downspout elbows, screening, overflow, and spigot
- Check stability of rain barrel at current location
- Check overflow discharge to make sure it is draining into the ground and not onto a parking lot, sidewalk, patio, etc.

Planning & Zoning

Municipal Regulations

Most municipalities and counties will not have any regulations on the books that would prohibit the use of residential rain barrels. The portion of the city code which discusses nuisances may have some applicability to your rain barrel if it is not maintained, so a thorough understanding of the code is recommended. Prior to building your rain barrel, it is also recommended that you contact your municipality to make sure there are no regulations forbidding the use of rain barrels and to learn of any restrictions applying to location or size.

Municipal Incentives

St. Louis Metropolitan Sewer District's Project Clear program awards rainscaping grants for projects including rain barrels and cisterns. For residents living in select municipalities within St. Louis County, the Deer Creek Watershed Alliance is offering a rainscaping cost-share program for residents who wish to landscape their yards to improve stormwater management. Landowners must apply for the rebates and may select a variety of rainscaping options, including installing a rain barrel, planting a rain garden, creating a bioswale, creating a green roof, developing lawn alternatives, installing a cistern, or amending soil. Rainwater harvesting qualifies for rebates but must be paired with a plant-based solution.

Some municipalities offer financial incentives to households with rain barrels. In Missouri, Springfield and Greene County residents are eligible for a rain barrel rebate fo 50 cents per gallon for rain barrels and larger rain harvesting systems. The maximum rebate per property is $300.

Community Outreach/Advocacy Ideas

Organizations that desire increased use of rain barrels by their constituents may need to increase their advocacy and community outreach practices. Some ideas for increasing interest in rain barrels are listed below.

- Provide public education materials online, in newsletters, and even with utility billings explaining

stormwater management and the importance of green technologies such as rain barrels to your citizens
- Provide contacts to community organizations and groups that can assist residents with the selection and installation of a rain barrel
- Create and host rain barrel workshops - these can be expanded to programs focused on "green gardening" and sustainability projects for the homeowner
- Provide a limited number of free rain barrels as a promotional and educational program
- Host rain barrel sales in a public park in partnership with vendors - perhaps even find non-profits and businesses willing to subsidize the cost to residents
- Host Do-it-Yourself DIY events to construct a rain barrel from scratch
- Provide art classes for adults and children aimed at rain barrel art
- Host a rain barrel art exhibition and community awards program
- Host lectures at local schools on stormwater management, water pollution, and the importance of sustainable practices such as rain barrels

Dollars & Cents

For Homeowners

The total cost for a rain barrel and all additional necessary parts can vary. Building your own rain barrel can cost anywhere from $10 to $40 or $50, depending mostly on the price of the drum. The most common size for a pre-built rain barrel system is 55 gallons and can range between $50 and $150, but around $100 is a common price. Smaller barrels, decorative barrels, and the building material used in creating the barrel can affect the price in either direction. St. Louis Metropolitan Sewer District's Project Clear program awards rainscaping grants for projects including rain barrels and cisterns. For residents living in select municipalities within St. Louis County, the Deer Creek Watershed Alliance is offering a rainscaping cost-share program for residents who wish to landscape their yards to improve stormwater management.

For Local Governments

For a government that wants to promote the use of rain barrels, there is essentially no cost. Governments that do not forbid the use of rain barrels and organizations who advocate for their use will incur minor costs typically associated with hours worked by staff. However, if the organization wishes to create programs and services for residents like workshops, classes, or rain barrel give-aways, there can be substantial costs associated with these actions. Some programs, such as giving a presentation to a local school art class about water pollution and conservation can have minimal costs if the presentation is given by staff members and the materials are donated by a local business.

Measuring Success

For Homeowners

The easiest way to evaluate your system is to check if the water is being collected within the barrel and if you are using all of the water that gets collected. If the rain barrel does not actually collect rain or if you do not use the collected rain, the system is not working as well as it could. For a more complex analysis, you could calculate how much stormwater runoff is being generated at your property and then calculate how much of this runoff is being kept off the streets and out of the sewers because of the rain barrel system. Also, a simple

comparison of water bills from before and after the installation of the system can indicate savings generated by using harvested rainwater.

For Local Governments

Establishing metrics for a rain barrel program depends on the involvement of a local government. If the city or county is unengaged, simply providing resources to homeowners to calculate their total stormwater run-off and therefore the percentage of water being retained by the rain barrel system may be sufficient. There are various tools available to help calculate stormwater run-off from a single parcel and/or roof, including a stormwater calculator from the EPA.

Otherwise, a city or county could develop metrics tailored to their specific programs. Tracking the number of rain barrels and cisterns in the city and the total amount of stormwater saved from the sewer system would be a useful report. The number of attendees at trainings and workshops, the number of entries into rain barrel decorative art contests, the number of clicks on a city website page geared towards public information on rain barrels, and similar strategies, would all be useful metrics to know if the city/county's programs are being accessed, and more importantly if community interest in rain barrels was increasing over time.

The most complex level of analysis would be attempting to partner with agencies capable of committing to long-range water quality studies within the community. Using sophisticated analytical tools such as GIS, a city/county could map rain barrels and stormwater management practices that lessen the runoff into streams, creeks, rivers, and other natural drainage areas. There should be a scientifically identifiable correlation between the increase in the local use of these practices and overall stormwater quality, targeting specifically the types of pollutants in water runoff from parking lots and roofs. Further, there should be a decrease of stormwater and runoff in the storm sewer system, which should have long-term cost savings to the city or county. One such example of an on-going analysis is in Cincinnati, Ohio.

Discover More

National Resources

The EPA offers a clearinghouse on rain barrels.

The EPA also offers information on rainwater reuse through their WaterSense program.

The state of New Jersey and Rutgers University offers a similar collection of local government resources.

The Carolina Clear program at Clemson University offers extensive resources for home owners regarding rain barrels including a rain barrel handbook.

Fairfax County, Virginia offers several Rain Barrel Workshops throughout the year which aim to increase advocacy and use of rain barrels. The county offers build-your-own workshops as well as distribution events/rain barrel sales.

Missouri and Illinois Resources

The City of Springfield Missouri offers information on a rain barrel rebate program in their community.

The Mid America Regional Council out of Kansas City offers residents resources regarding rain barrels.

The University of Illinois Extension offers resources to make your own rain barrel.

The City of St. Louis website offers information about disconnecting downspouts and installing rain barrels.