Issue: Rainwater Harvest

Photo by: Innovative Water Solutions LLC

I'M FOR THE Hill Country

HCA is a passionate community caring for the unique features, spring-fed streams, heritage ranch lands, spectacular beauty and vibrant culture of the Texas Hill Country for the benefit of future generations.

In this time of stretching our natural resources to fit unrestrained usage, we must come to see beyond today and understand water scarcity as the increasingly imminent reality that it is. As the demand for water in the Hill Country skyrockets due to rapid development, population growth and drought, we become more aware of the necessity to curb consumption and live within our 'water means'. This realization should drive us to protect our current water supply, practice water conservation, and seek out new and sustainable sources of water to satisfy booming demand. **One easy, proven way to meet our water supply need is rainwater harvesting—the collection, storage and utilization of rainwater.**

Rainwater Harvesting Inspires Water Conservation!

Average national water use:
60 gal/person/day
Rainwater harvesting user:
35 gal/person/day

Rainwater harvesting is not a new invention; it can be traced back thousands of years. As the recent concepts of sustainability, smart growth, and responsible development become more widely known, more and more people are returning to the practice of capturing and using the rain that falls on rooftops for all or part of their water supply.

Over the next 50 years the population of Texas is expected to double. Already, there are places in Texas that are experiencing water shortages because demand is outpacing supply. In the Texas Hill Country, many people are choosing rainwater over groundwater not only for its ease and availability, but also for its taste, purity, and reduced cost.

A rainwater system is fairly simple to install, is low-maintenance, and provides clean, chemical-free water for for landscaping and other non-potable uses. With proper treatment it becomes potable, drinkable, and available for all indoor household uses.

Rainwater can also be used in commercial and industrial applications, for storm water control, livestock and wildlife watering, and fire protection. Other benefits of rainwater harvesting are notable. It reduces public water supply demands, thus affecting the fuel, resources, infrastructure and maintenance costs used in providing water to the public. A recent study funded by the Texas Water Development Board showed the potential viability and cost savings of an entire subdivision where rainwater is captured and used at each home and building. Viewed at: https://www.twdb.state.tx.us/innovativewater/rainwater/doc/RainwaterSupplyStrategy.pdf The rainwater capture potential throughout the state of Texas is enormous. Approximately 38 billion gallons of water could be conserved annually if only 10 percent of our roof area was used for rainwater harvesting.

Perhaps most importantly, people using captured rainwater as their primary water supply, both indoors and outdoors, develop a water conservation ethic that becomes natural and a source of pride.

"Given the acute problem of water scarcity that many are likely to face in the near future, the direct exploitation of the natural, simple, and most fundamental source of renewable fresh water—rain—should not be ignored."

– Sandra Postel
Last Oasis: Facing Water Scarcity, 1992

hill country alliance

Top 7 Reasons To Harvest Rainwater

1. *Rainwater is clean, soft, and pure. It's free of salts and other harmful minerals so it leaves no residue on plumbing, hair, clothes, etc.*

2. *It requires minimal treatment to be safe for drinking and other indoor household uses.*

3. *It's good for the environment. RWH reduces run-off, erosion, and contamination of surface water by sediments, fertilizers and pesticides. It also prevents flooding and turns potentially destructive storm water into a water supply asset.*

4. *It's good for the landscape – plants love its natural supply of nitrogen!*

5. *It's efficient. A 2,000 sq ft roof can collect 40,000 gallons with a 32" annual rainfall.*

6. *It's economical. As municipal water prices rise, collecting tens of thousands of gallons from rain (which is free) just makes sense!*

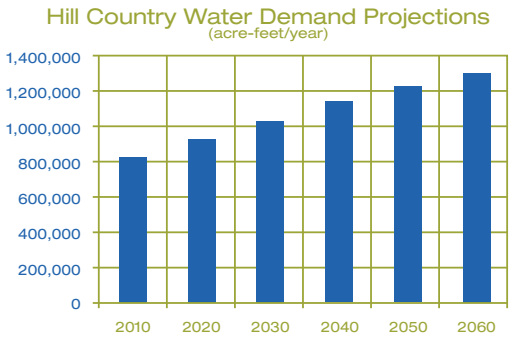
7. *A RWH system is simple to install and maintain. If you don't want to do it yourself, there are plenty of experts around to help.*

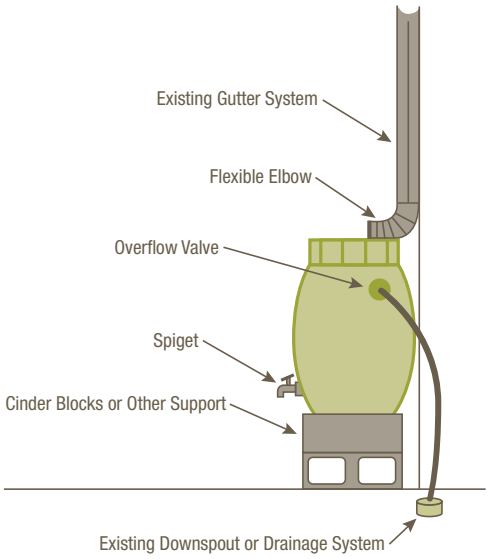
Why Harvest Rainwater?

In 2010, municipal (urban & rural) water shortages exceeded supplies for 60 water suppliers in 12 of the 17 Hill Country counties. The amount by which need exceeds supply will only increase in the future. By 2050, the Hill Country's population is projected to grow by 70 percent.

– **70%**: Population growth by 2050
– **31** Inches: Average annual rainfall
– **16** to **32** Inches: Average net evaporation rate

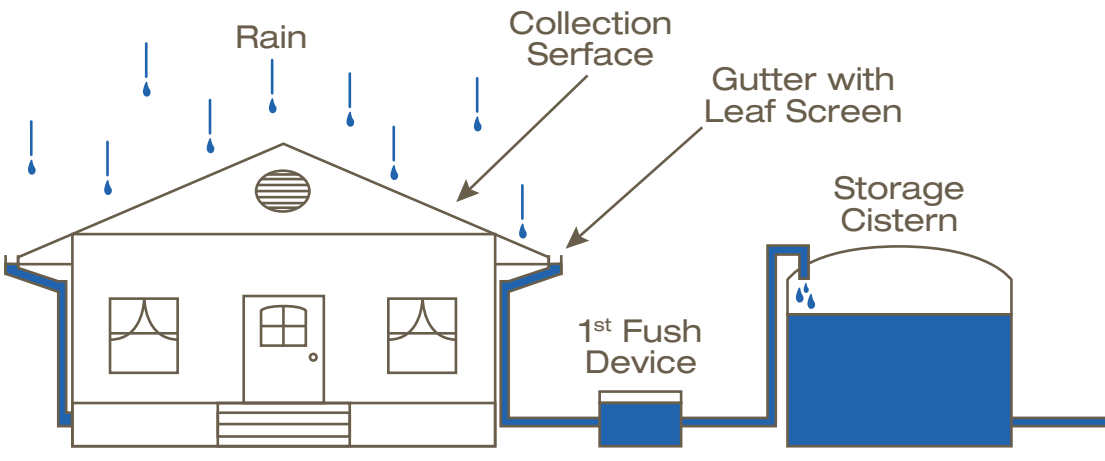
Rainwater harvest systems range from the relatively simple—channeling rain from a downspout into a barrel or cistern for use on landscaping—to the quite complex, involving pumps, filters and water treatment equipment to yield potable water for use inside the house. Cost for installing rainwater harvest systems can range from a few hundred dollars to tens of thousands of dollars, depending on the size and complexity of the system.





It is important to get the size right in designing rainwater collection systems for household use. Considerations include roof area, average household water use, average monthly rainfall and rainfall event sizes. The Texas Water Development Board (TWDB) estimates that for a 1-inch rain event, .62 gallons of water can be collected from each square foot of catchment area. When factoring in natural system inefficiencies including spills, leaks, evaporation and blockages, the collection rate drops to roughly .5 gallons per inch of rain.

Research shows that in the Texas Hill Country, a 4-person household with reasonably conservative water use typically requires a roof space of 4,500 square feet and a cistern volume of 35,000 gallons. A rainwater harvest calculator can be found at http://rainwaterharvesting.tamu.edu/calculators/. It is always a good idea to speak with a professional rainwater harvest system designer if you have any questions.



Rainwater Harvest 101: Landscape and In-House Uses

Catchment Area: A common asphalt shingle roof will work for landscape purposes only. If catching water for potable use, metal is best, as most other surfaces will contain contaminants not safe for indoor use. Slope of the area affects how quickly runoff occurs.Size determines how much rainwater is available for harvesting. Use this simple calculation: Catchment area (sq ft) x rainfall (in.) x 0.623 (conversion factor) = harvested water (gal).

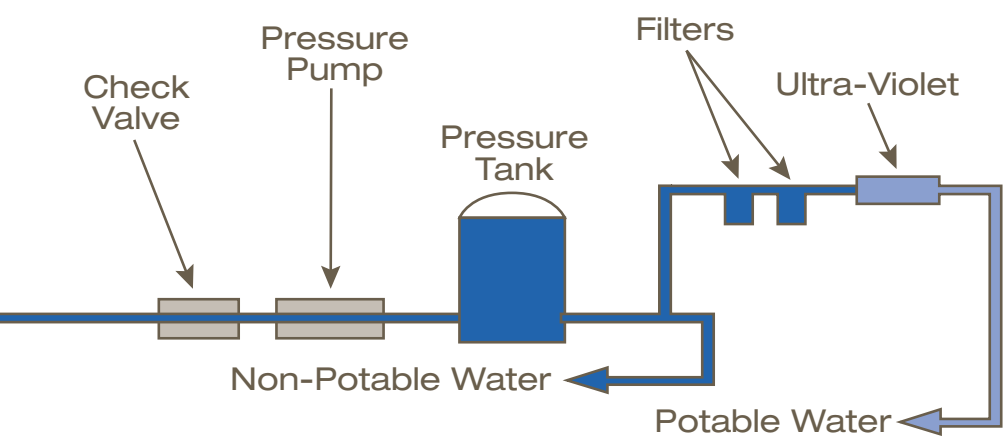
Conveyment: A.K.A. gutters and downspouts. For best results pay attention to sizing, proper installation and appearance.

Storage: Commonly referred to as barrel, cistern or tank, these come in a variety of materials, shapes, and sizes. Materials include steel/metal, concrete, wooden, fiberglass, and polyethylene/ polypropylene (plastic). Allow for overflow and design accordingly to prevent erosion. Supply lines feeding cisterns should remain dry after a rainfall event. Make sure you have a level, solid surface on which to place your storage tank.

Treatment: These applications will protect your rainwater from debris and contaminants. Landscape only systems require minimal treatment but can include fine mesh gutter guards, a first flush device directly under your downspout to remove any debris that comes with the first few gallons of runoff and a screen at the tank's inlet, downspout or above the first flush device. For complete household systems, the following are also required to ensure safe water: a filtration system to remove microorganisms and other sediment and bacteria, and a disinfection system such as UV light or activated charcoal.

Distribution: This includes pipes, pump, pressure tanks or anything else that is needed to transport stored water to where it will be used.

Maintenance: Once installed, it is important to perform regular maintenance on your system. Check gutters and gutter guards regularly to prevent debris from entering the pipe systems. Inspect the screen on top of the tank or barrel frequently to keep debris and mosquitoes or other insects from entering. For a barrel system, clean out the inside of the barrel once a year (preferably when barrel is fully drained) to prevent organic debris from building up. Use vinegar or another non-toxic cleaner and a scrub brush on a long stick for accessing the entire barrel. For larger systems, preventing organics from entering cisterns or tanks will reduce maintenance requirements.



Rainwater Harvest Incentive Programs

Austin: *The City of Austin Water Utility offers a capacity-based rainwater harvest rebate program. Residents are eligible for $.50 per gallon for non-pressurized systems and $1 per gallon for pressurized systems, and may receive up to 50% of the system cost. For more info visit http://austintexas.gov/department/rainwater-harvesting-rebates*

San Marcos: *The City of San Marcos offers up to $50 in rebates for the purchase of eligible rain barrels. For more info visit www.rainbarrelprogram.org/sanmarcos*

New Braunfels: *New Braunfels Utilities is offering a rebate of $.50 per gallon, up to $250 total. The rebate is credited to the utility account. For more info visit www.nbutexas.com/Conservation/Rebates/WaterConservationRebates/RainwaterHarvestingRebate*

Sunset Valley: *The city of Sunset Valley is offering up to $3,500 in rebates for residents who install eligible rainwater harvest systems. For more info visit http://www.sunsetvalley.org/*

Kerr County: *The Upper Guadalupe River Authority is offering a rebate of up to $50 for eligible rainwater catchment systems. For more info visit http://www.hgcd.org/pdf/Rainwater-CatchmentRebate032511.pdf*

Hays County: *As of January 2014, the Hays County commissioners are in the initial stages of establishing a Rainwater Initiative Fund ("RAIN" Fund) to provide loans for residents interested in installing rainwater collection systems. For more info visit http://www.hillcountryalliance.org/HCA/News012214*

The Growing Case For Rainwater Collection: Texas Rain And Drought Facts

Given the drought-prone climate of the Hill Country, efficiency of rainwater harvesting is important. For example, in the Boerne area, 41% of rainfall events are 0.1" or less; 19% of rainfall events are 0.1 to 0.25".

No single year during the drought of record in the 1950s was as dry as the year 2011 in which Texas averaged 14.8" of rain.

2011 and 2012 were the warmest years since 1985. These heat records have resulted in a dwindling water supply.

As of July 19, 2013, Lake Travis and Lake Buchanan are at 36% capacity.

As of June 4, 2013, 95% of Texas is in some form of drought condition and 16% is in exceptional drought.

In late January 2012, the town of Spicewood Beach literally ran out of water. As of summer 2013, 1,100 residents were still forced to depend on the delivery of water from tanker trucks.

In early 2013, state climatologist John-Nielsen Gammon informed the Texas Legislature that temperatures in Texas have risen an average of 2 degrees (F) since 1970, causing the drought to worsen.

SOURCES: http://stateimpact.npr.org/texas/tag/drought/
http://www.twdb.state.tx.us/apps/droughtinfo/default.aspx
https://www.twdb.state.tx.us/publications/reports/RainwaterHarvestingManual_3rdedition.pdf

Each year HCA awards grants to Hill Country schools to help advance rainwater harvesting and water conservation programs. Grant funding is raised by auctioning beautifully hand painted rain barrels like this one painted by Wendy Little. Learn more at www.rainbarrelauction.com.

15315 Hwy 71 West
Bee Cave, TX 78738
512-263-9147
info@hillcountryalliance.org
www.hillcountryalliance.org

RAINWATER REVIVAL
A HILL COUNTRY ALLIANCE EVENT

Rainwater Revival

Each year the Hill Country Alliance hosts the Rainwater Revival, a celebration of rainwater collection, conservation and common sense water use practices. This festive and free event features informative speakers, rainwater system displays, conservation-related vendor booths, food, music and more. For more information and to find out where this year's Revival will take place, visit www.rainwaterrevival.com!

Helpful Resources:

http//rainwaterharvesting.tamu/edu

http://www.lcra.org/water/save/rainwater.html

www.hillcountryalliance.org/HCA/Rainwaterharvesting

The Texas Rainwater Catchment Association:
http://www.texrca.org

Raymond Slade,
Certified Professional Hydrologist

hill country alliance