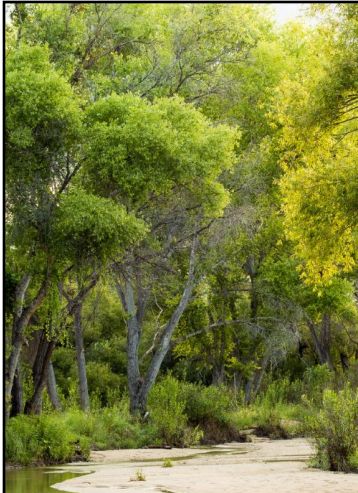
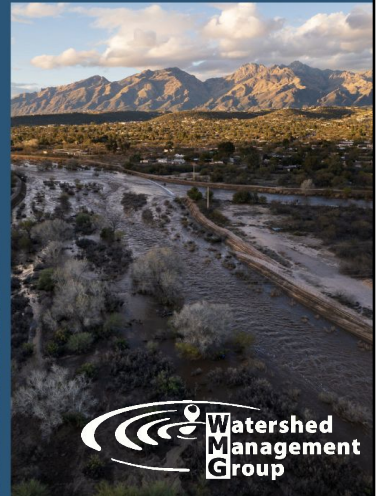




RAINWATER HARVESTING & TUCSON WATER REBATE



Presentation created by humans for humans



Hello Neighbors!

Watershed Management Group (WMG) is a non-profit organization serving Tucson beyond since 2003.

We believe the relationship between communities and the environment creates prosperity for all.

Contact Us

info@watershedmg.org

520-396-3266



Guess how many gallons of city water our 0.5 acre Living Lab used in all of 2024?





The Living Lab supported

- 16 staff
- 12 interns & apprentices
- 20 docents
- 4,000 visitors
- 5 chickens
- 1 desert tortoise
- Native desert landscaping & food forest

on zero gallons of city water



Class Objectives

- Introduce active and passive water harvesting systems
- Understand basic rainwater harvesting concepts and vocabulary
- Learn best practices for low-maintenance and low-cost systems
- Learn how to submit a successful rebate application to Tucson Water

City of Tucson's One Water 2100 Plan

Greywater

Water that has already been used but is landscape-safe (laundry or shower)

Rainwater

Water falling on a roof or other surface that can be captured

Stormwater

Water running in the streets and gutters that can be captured



Santa Cruz River, 1904

Seen from "A" Mountain

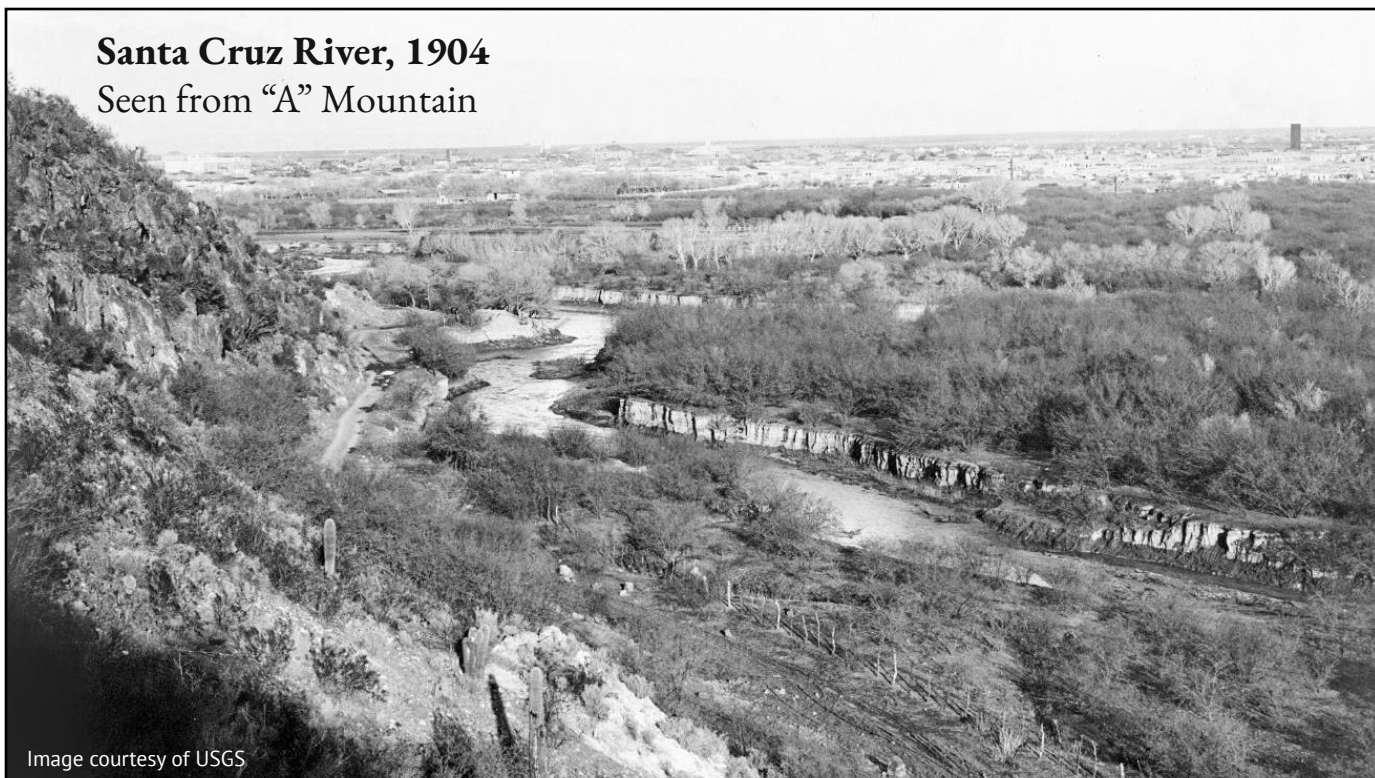


Image courtesy of USGS

Santa Cruz River, 1913

Seen from Martinez Hill

(near current San Xavier exit on I-19)

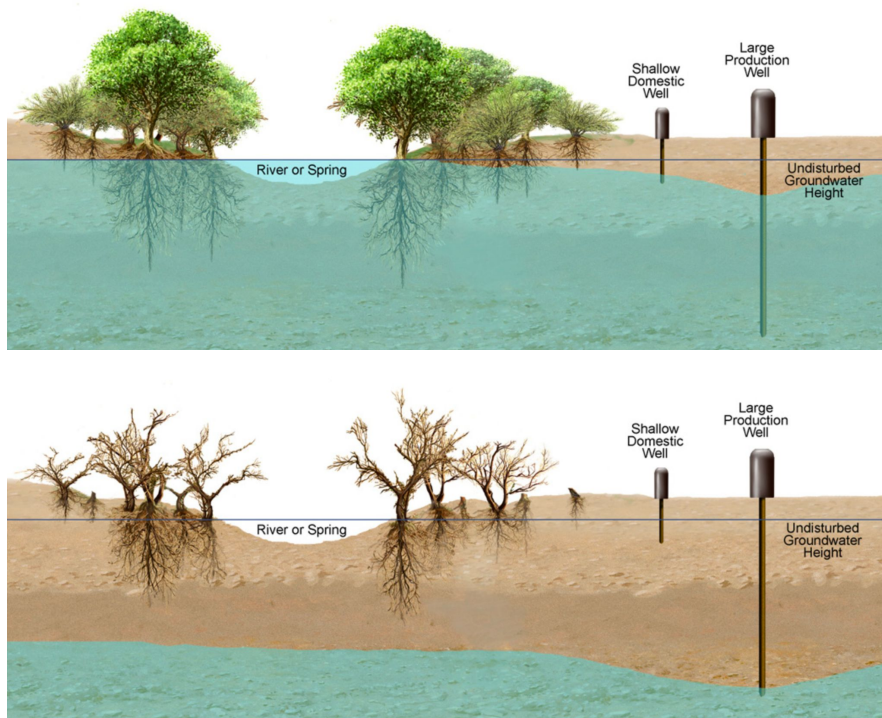
Image courtesy of USGS

Santa Cruz River, 2002

Seen from Martinez Hill (near San Xavier exit on I-19)

Image courtesy of USGS

Groundwater levels impact on vegetation

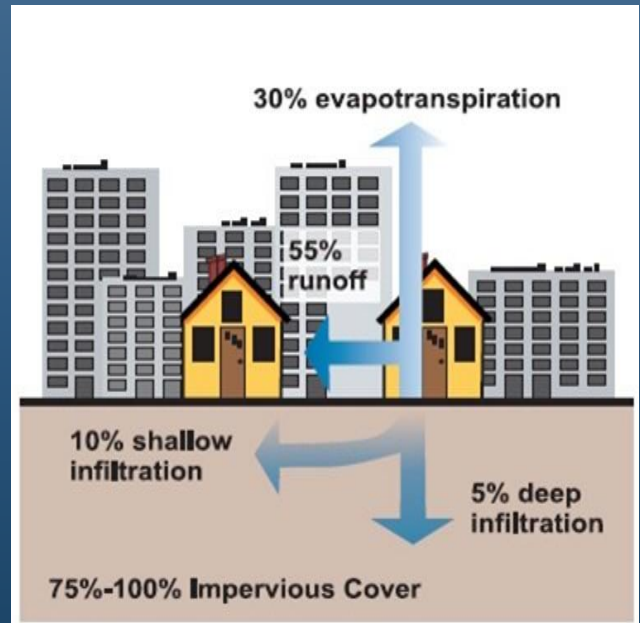
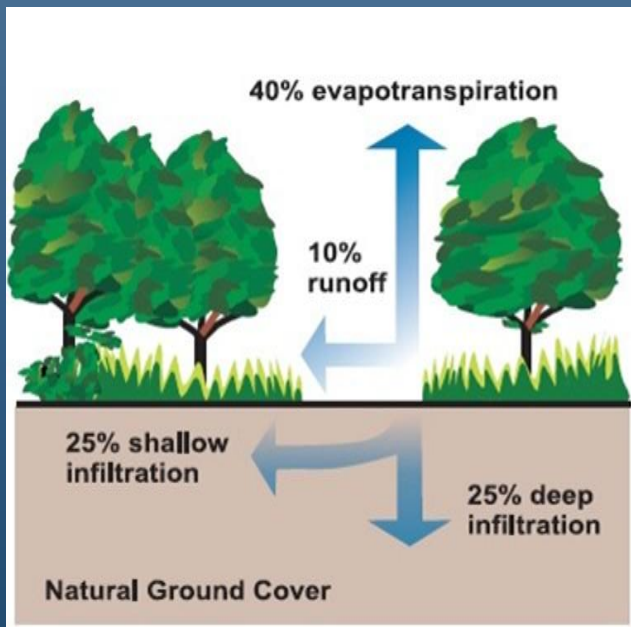


Source: Pima County Aquifer
Monitoring Report, 2008

50 Year Vision

In 2070, the Santa Cruz River, Rillito River, and their tributaries are a cooling ribbon of green that's central to Tucson's economy, culture, and livability.





Misconception: Water-wise landscaping is bare, with few plants and lots of gravel



Reality: The Sonoran Desert is the lushest desert in the world with abundant biodiversity of plants, insects, and animals

Rainwater Harvesting Vocab

Water Budget

The balance between how much water you have available (*rainwater, stormwater, greywater, ac condensate*) and how much you use

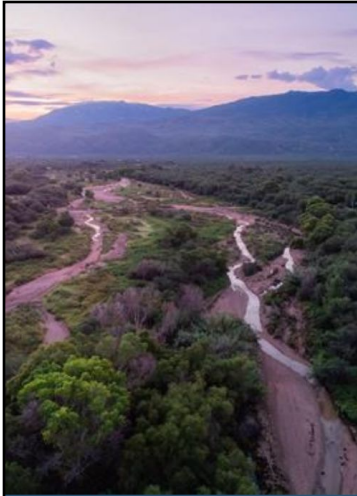
Passive Systems

Water is stored in the soil

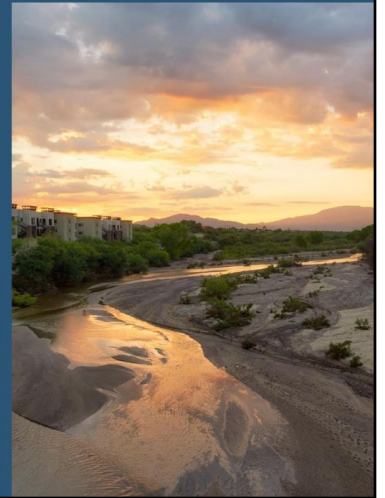
Active Systems

Water is stored in a tank





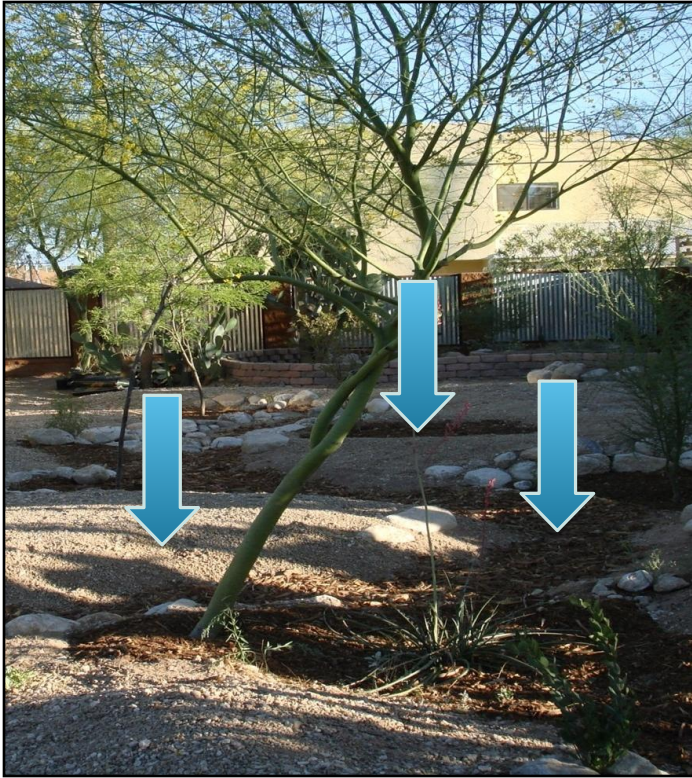
PASSIVE RAINWATER HARVESTING SYSTEMS



Passive Rainwater Harvesting

- Cheapest storage option for large amounts of rainwater
- Uses gravity to distribute rain runoff
- SLOW, SPREAD, & SINK the flow





Passive System Vocab

Basin

A dug-out low place where rainwater can gather and sink in

Berm

A built-up area that holds water in the basin. To prevent erosion, berms are 2 – 4 times as wide as they are tall. Can double as path.

Basin Wall

The side of a basin that is at ground level at the top. May be reinforced with rocks.

Passive System Vocab

Overflow/Spillway

A low place in a berm that allows excess water to flow out of the basin. Lined with rocks. 4 inches below the top of the basin wall/berm.

Basin Bottom

The flat dirt floor of the basin. Covered by 2-4 inches of **organic mulch**.

Basin Depth

The vertical distance between the basin bottom and the bottom of the overflow. Minimum depth 4"





Passive System Vocab

Basin Size

Basin depth x length x width

Basin Volume

Basin size x 7.48 gal/cuft

Basin Capacity

Basin volume x 1.5

The 1.5 multiplier accounts for water that infiltrates (soaks) into the soil

EXAMPLE:

10ft long x 12ft wide x 0.67ft deep x 7.48 gal/cuft = 601 gallons

With infiltration multiplier
 $601\text{gal} \times 1.5 = 902\text{ gal} = \902

Passive System Vocab

Swale

A channel that directs moving water into a basin or other area—frequently lined with rocks

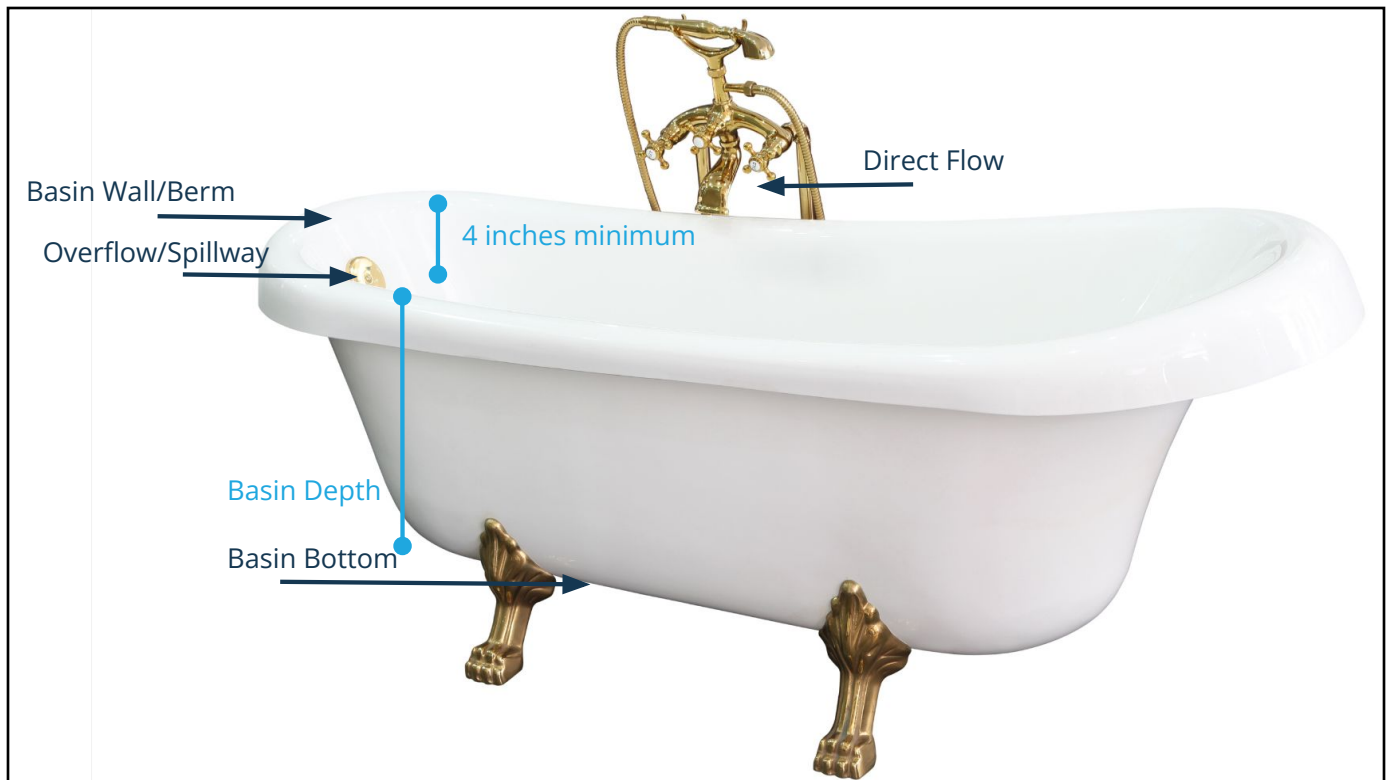
Direct Flow

Incoming water that is channeled to the basin through a downspout, pipe, or swale

Sheet Flow

Incoming water that is NOT channeled and instead flows broadly over the ground surface





Basin Planting Zones

Upper

Tops of berms and above the basin wall – cacti & lowest water use plants

Middle/Terrace

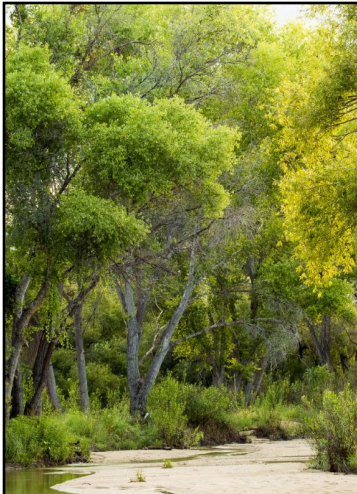
A flat planting area above the basin bottom but below the top – trees and mid-water use plants

Bottom

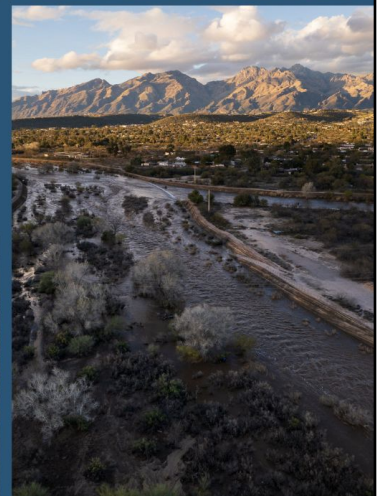
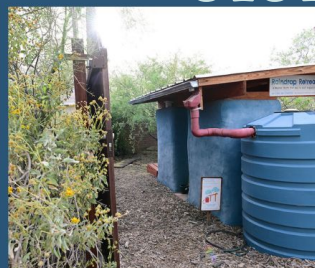
Wettest area – grasses, riparian shrubs, high water tolerance

Right of Way Basins

- Harvests stormwater
- Supports shade in your neighborhood
- [Curb cut details](#) and [Required permit information](#)
- Can be a core or a cut
- Tucson Water rebate \$1/gallon if clear route for water to enter basin
- 50 cents/gallon if no clear entry point for water



ACTIVE RAINWATER HARVESTING SYSTEMS



Active Rainwater Harvesting

- Provides water source in dry periods
- Can be purified for drinking water
- Supplemental water for needier plants
- Water for animals & livestock



Active System Vocabulary

Catchment Area

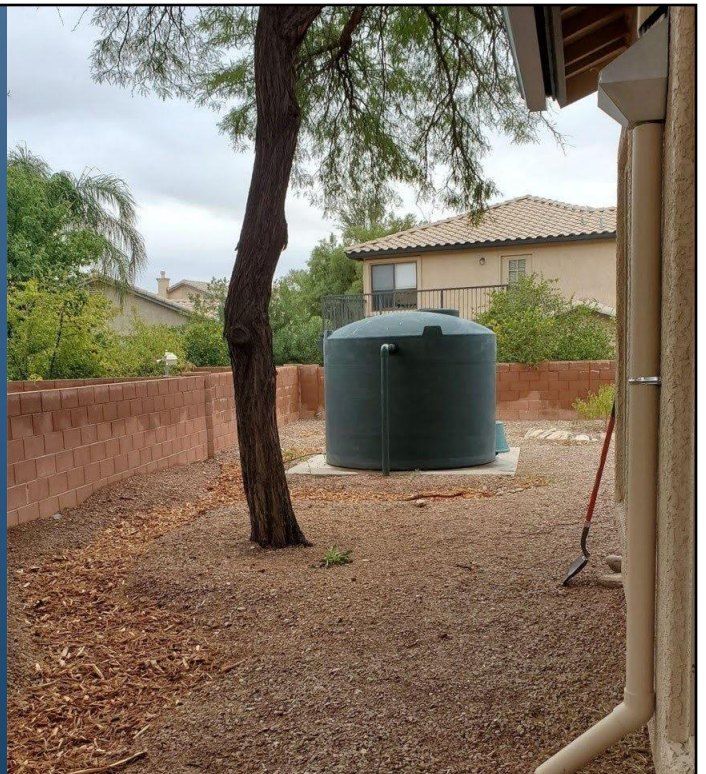
The roof or other surface from which you are gathering water

Dry Inflow

A tank system where water flows through a gutter directly into your tank

Wet Inflow

A tank system where water flows from the catchment area through an underground pipe to get to your tank





Keeping Your Water Clean

Leaf Diverter/Rain Head

A screened box that sits below the gutter drop/downspout to keep large debris out of the tank

First Flush

A pipe that fills with dirty water from the roof and then overflows into the main tank inlet

Planning for Overflow

Overflow Pipe

The pipe that exits near the top of your tank and allows excess water to leave your tank in a controlled way

Pop Up

A cover on the end of the overflow pipe that allows water out but prevents critters from getting in





What About Water Pressure?

Full Port Valve

A wide-mouth water valve that allows more water through than a standard hose spigot

Low Pressure Irrigation

Irrigation methods that work with low water pressure: ollas, low pressure irrigation timers, large diameter irrigation line

Pumps?

If you install a pump, you **must** install a specific backflow preventer at your water main

Ensure Best Practices

- Use high-quality, appropriate materials: schedule 40 PVC; rain tanks, not IBC totes or barrels
- Paint all plastic parts exposed to sun
- Install closed systems: no light into tank; screens at inlet & outflow
- Install systems to minimize maintenance: accessible debris filters & first flush devices
- Install tanks on level pads: concrete or compacted sand, not gravel





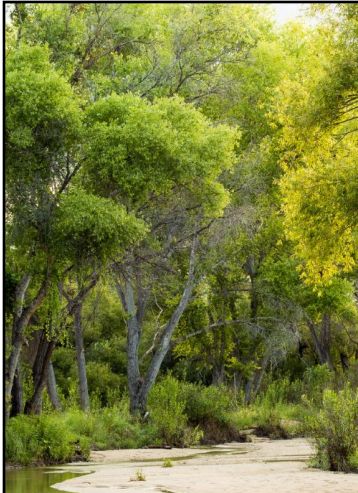
Maintenance

Have a specific plan!

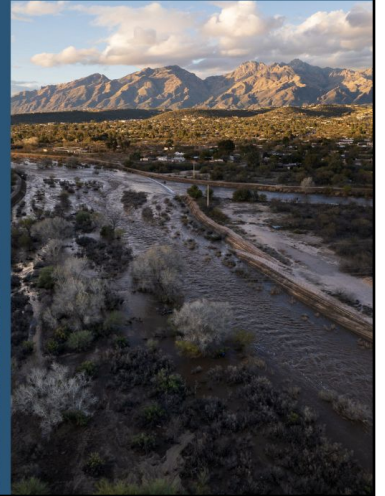
- Clean gutters and leaf diverters
- Check and reset first flush
- Check for leaks
- Inspect stability and integrity
- Clean/flush/replace filters
- Test water annually (if drinking)



Questions?



TUCSON WATER REBATE



Goals of the Rebate Program

- To capture rainwater as a resource
- To increase vegetation without increasing potable (drinkable) water use
- To decrease potable water use for landscaping
- To reduce stormwater runoff



- Up to \$1900* per *address*
- Rebate is based on *gallons of water stored* NOT dollars spent
- Available to active residential & small commercial Tucson Water customers
- Can be an **active, passive,** or **combination** system
- Must demonstrate a **beneficial use** for the harvested rain



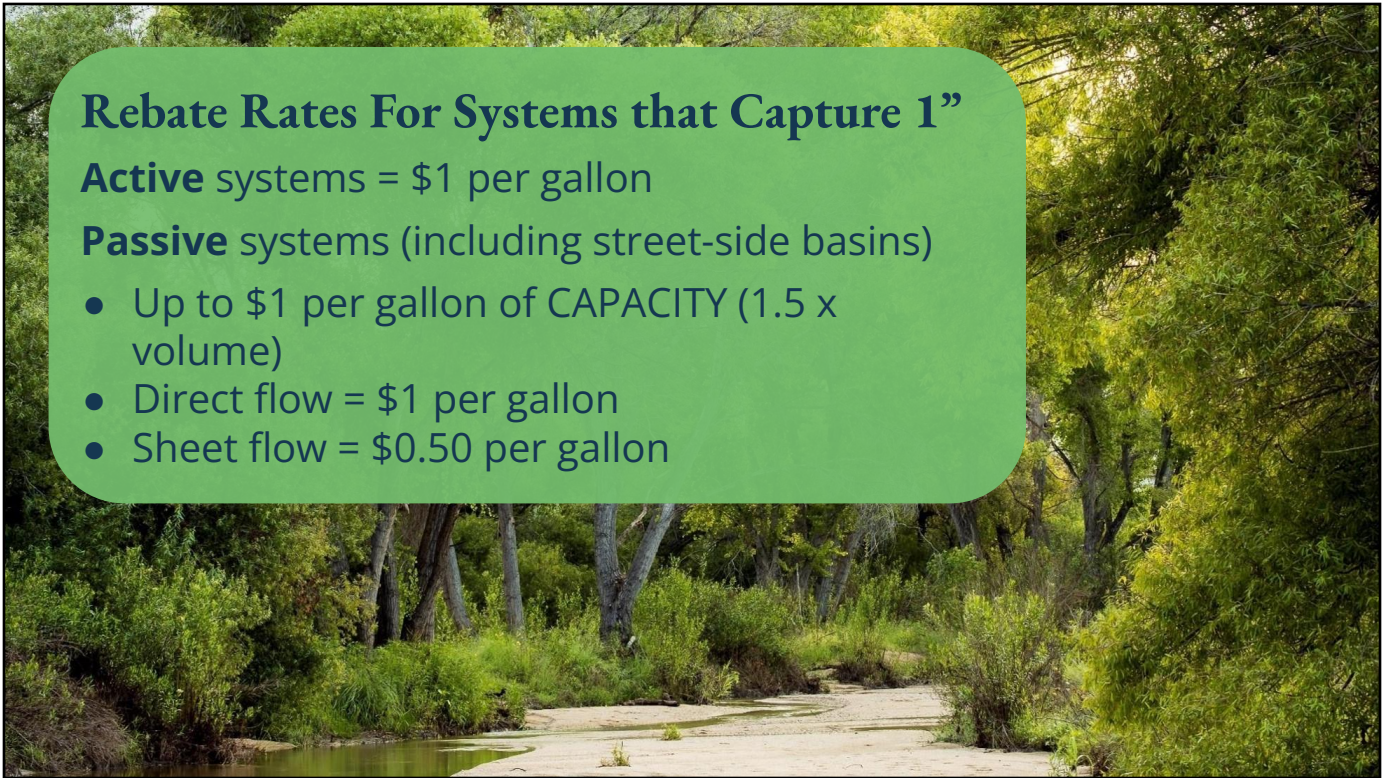
To qualify for **\$1/gallon rebate**, your system must be able to harvest and store **all** the water that runs from your catchment area (the roof area you are collecting from) in a **1" rainfall event**

Rebate Rates For Systems that Capture 1”

Active systems = \$1 per gallon

Passive systems (including street-side basins)

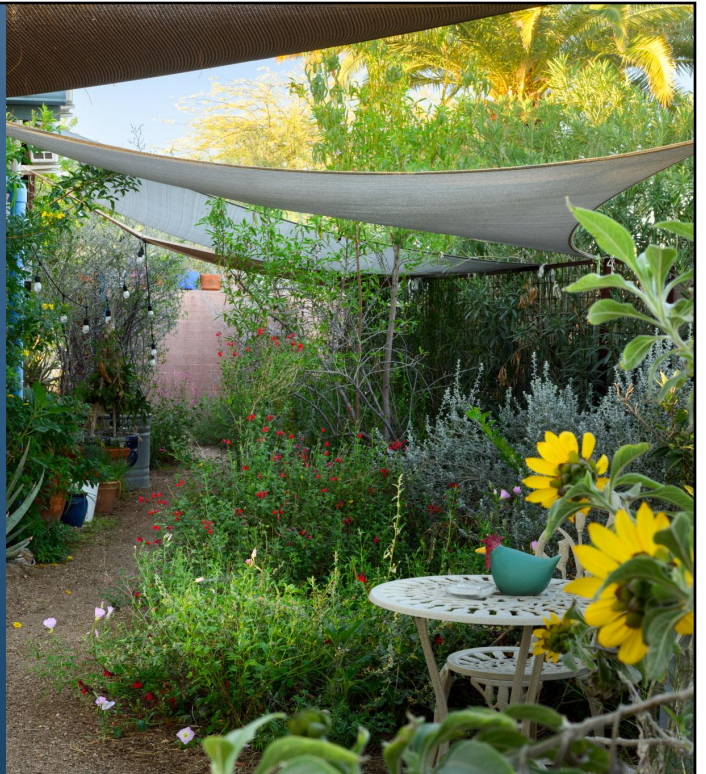
- Up to \$1 per gallon of CAPACITY (1.5 x volume)
- Direct flow = \$1 per gallon
- Sheet flow = \$0.50 per gallon



Beneficial Use Policy

Water from the system must be used for one or more of the features listed below:

- Beneficial Uses without Tanks (plant requirements apply)
 - Drought-tolerant trees
 - High water use trees
 - Shrubs/native grasses
- Beneficial Uses that require a Tank (not subject to plant requirements)
 - Edible garden
 - Potted plants
 - Lawn/groundcovers
 - Pool
 - Water feature





Plant Requirements Based on Total System Storage

Less than 800 gallons =
no vegetation requirement

800-1,499 gallons =
1 tree or 4 shrubs

More than 1,500 gallons =
2 trees or 8 shrubs; or
1 tree and 4 shrubs

New! Treebates

- \$50 for one tree and \$49 for a second tree, not to exceed \$99
- Only drought-tolerant trees on qualifying list
- Only new trees – existing trees not eligible
- Trees *must* be getting water from the harvesting system being rebated





HOW TO APPLY

Application Process

CUSTOMER TAKES WORKSHOP

The customer required to attend RWH workshop held on or after July 2023.

Customers applying for rebate after July 2026, but have previously taken the workshop, will be subject to the updated 2026 program policies.

SUBMIT PRE-APPROVAL

Receives APPROVAL or DENIAL notification via email to proceed with installation.

Customer has 1 year from pre-approval notification date to install system and schedule site visit.

SYSTEM INSTALLATION

Customer receives approval notification.

Customer receives links to upload receipts & W-9 Forms via Document Upload Link (link access also via Tucson Water Website, email conservation@tucsonaz.gov or call 520-791-4331).

CALL TO SCHEDULE SITE VISIT

Installation complete: Customer calls Tucson Water to schedule site visit.

Beneficial Use policy will be enforced and must be clearly evident during site visit.

FINAL REVIEW & REBATE DISBURSEMENT

After site visit, application goes through final review and rebate processing.

Customer receives notification of rebate application completion.

Expect rebate check 4-6 weeks after final rebate approval.

4 Before
Photos

Site Plan

ROOF AREA(S) Square foot TOTALS of areas of your roof you are planning to collect & re-direct runoff from

TANK(S) Show placement & capacity of any tank(s)

BASIN(S) Show placement of any basins & measurements. Show on-ground water flow direction towards basin(s).

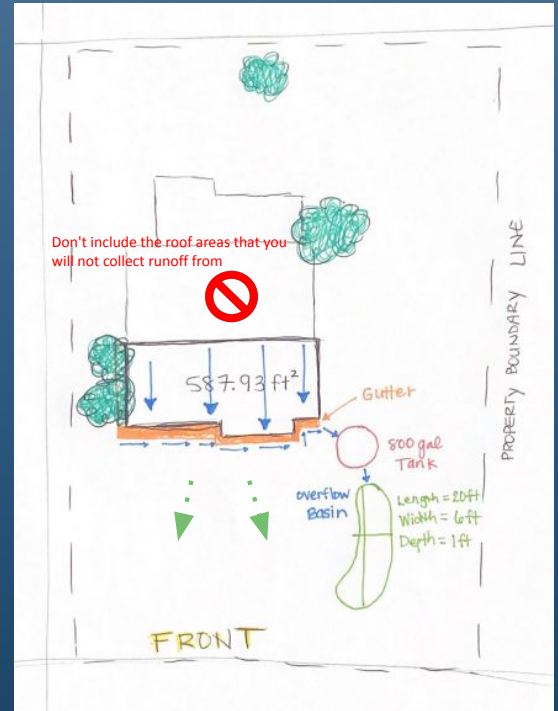
NUMBER THE BASIN(S) Number your basins so they match your form submittal

ROOF AREA Roof area and direction of water flow off the roof

GUTTER Placement & direction of flow

FRONT Front of the property

USE What the water will be used for (trees, garden, etc.)

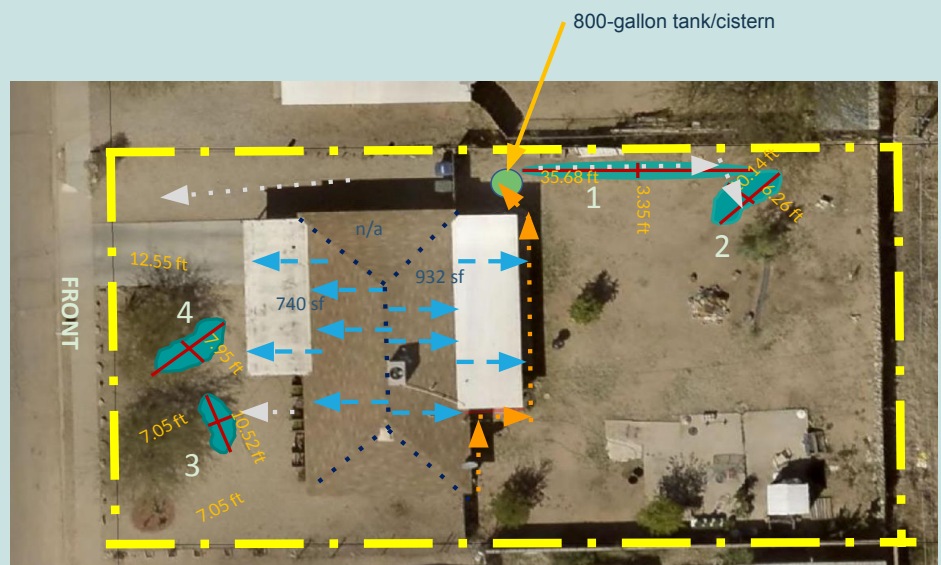


Site Plan

- Site inspection will be based on submitted site design

Key

- Property line
- Roof rainwater flow direction
- Onsite rainwater runoff
- Gutter
- Basin
- Basin measurement lines
- Cistern/tank
- 1. Number basins



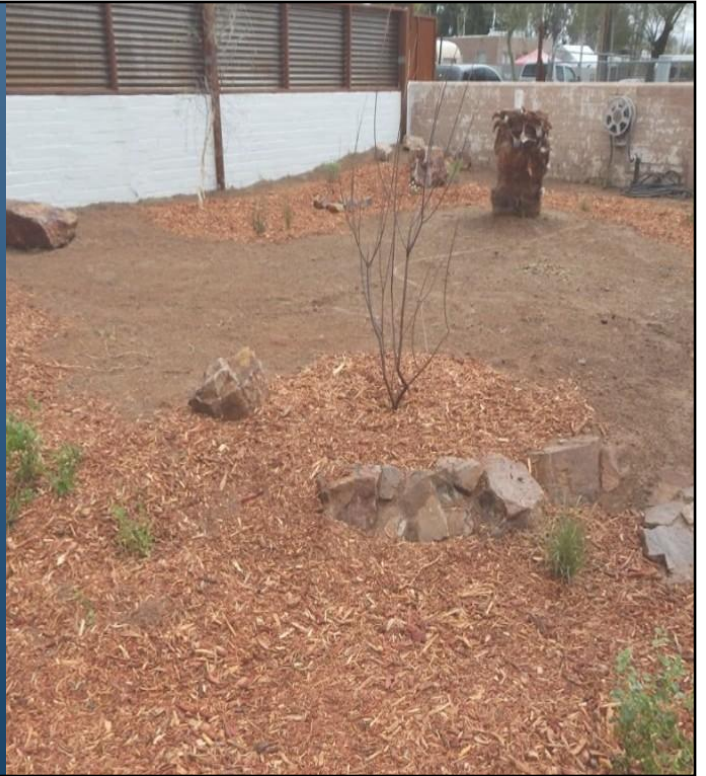
Calculation Resources

Measuring Roof Area:

- [Map Tucson](#)
- [Google earth](#)
- [Pima Maps](#) - Create printable base map to draw over for site plan

Calculating Roof Runoff and basin size

- WMG - [Rainwater Rebate Site Plan calculator](#)
- Tucson Water [Rebate Application Form](#)













Resources

- SERI Limited Income Program seriaz.org
- Tucson Water conservation@tucsonaz.gov 520-791-4331
- WMG's [Rain Garden Care Guide](#)
- WMG's [Rain Garden](#) & [Rain Tank](#) How-To webpages
- [WMG consultations](#) for site assessments and suggestions
- Brad Lancaster's *Rainwater Harvesting for Drylands & Beyond*, Volumes 1 & 2
- The Rain Store
- [Tucson Water Harvesters FB Group](#)



Don't forget to report your attendance!

Scan QR Code or visit:

docs.tucsonaz.gov/Forms/Water-Rebate-Workshop-Attendance



Invest Now in Our Water Future

Our work is possible thanks to our network of donors.

Please Join the Flow today!



watershedmg.org/give

Next Steps

- Share class feedback with us!
- Report attendance to Tucson Water
- Gather resources
- Work on your design

**GIVE US FEEDBACK ON
THIS CLASS**

SCAN ME



THANK YOU FOR JOINING