
Rain Gardens

Rainwater harvesting often uses a variety of techniques to keep water on-site for passive landscape irrigation or storage in tanks for subsequent use in the landscape. In high rainfall areas, their main benefit is passive treatment of stormwater runoff. In Arizona, rain gardens perform the stormwater treatment function in addition to passive rainwater harvesting that directs overland flow to planted depressions. A rain garden is a shallow depression in the ground that captures rain from roof gutters, runoff from a higher slope, a driveway, compacted soil, etc. It can be planted with native or landscape plants.

As stormwater moves over impervious surfaces, it picks up and carries with it fertilizer, pesticides, pathogens, toxic contaminants, sediment and other pollutants before entering storm drains. These drains eventually lead to local waterways. Polluted runoff can harm aquatic life and make the waterways unsuitable for recreation and other uses. By impounding the water and using it to irrigate plants, the rain garden also acts as a “biofilter” that removes excess nutrients and allows bacteria to be neutralized in the soil.

Studies along Oak Creek, which runs from Flagstaff, through Sedona, and flows into the Verde River near Cottonwood, have been detecting the bacterial contaminant *Escherichia coli* (shortened to *E. coli*) for many years. This is the reason for closure of Slide Rock State Park to swimming at times during the year. *E. coli* is commonly found in the lower intestine of warm-blooded organisms and, when detected in the environment, is correlated with fecal contamination. Studies in the Oak Creek watershed have detected *E. coli* originating from human, raccoon, skunk, elk, dogs and white-tail deer using genetic techniques which could differentiate between animal species. This work was done by agencies and universities in partnership with the Oak Creek Watershed Improvement Council. It provides an example of how rain gardens could mitigate localized pollution in our area and is a reminder that harvested rainwater can contain pathogens and should be used with discretion on food crops.

Many resources for rain gardens are available on-line. However, not many of these are developed for the arid west. Still, we can combine principles of rain gardens and passive rainwater harvesting for multiple benefits. In most residential settings, you will be trying to capture runoff from your house roof, driveway, sidewalks and other impervious surfaces and directing it to your rain garden. This can be accomplished by piping the downspout directly into your garden, or by letting it run over the land surface before entering the garden.

When assessing your property for a potential rain garden, consider the following:

1. Avoid placing the rain garden in a low spot in the yard that always seems wet. A rain garden is not a water garden or a wetland. Placing it in poorly drained soils may lead to slow infiltration and unwanted long term ponding.
2. Keep your rain garden at least 10 feet away from your house to protect the foundation and minimize potential pest problems (rodents, wood damaging insects, etc.).
3. Do not install the rain garden over your septic system, or close to your domestic well.
4. Do not install a rain garden in an area where bedrock or stone outcrops will prevent adequate drainage.
5. Avoid steep slopes. Rain gardens can be installed using a retaining wall design on moderate slopes, but the construction of this type of garden is more complicated. Rain gardens are easiest to install in flat or slightly sloped areas.

Plan for overflow from the garden. Although your garden will be sized to contain the most frequent storms, it will likely not contain the increased volumes of water from larger storms. Direct overflow toward another rain garden or area which can benefit from it. Do not direct overflow towards your foundation or other features which can be damaged.

Rain gardens may not fit every site, but should be considered for commercial/retail areas and housing developments. Retrofits are often possible, but rain gardens should always be considered during the planning/design stages.



Additional Resources:

[Rain Gardens and Bioswales](#)

Utah State University Cooperative Extension

[Rain Gardens: Filtering and Recycling Rain Water](#)

Iowa State Cooperative Extension

[raingardensiowastate.pdf](#)

Note: plant lists from the eastern and midwestern states are not appropriate for the arid southwest. Use local Cooperative Extension resources to select plant materials for your area.

[Harvesting Rainwater for Landscape Use](#)

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