

# Demonstrating the Nexus Between Water Efficiency and Stormwater



## TODAY'S SPEAKERS

- **Bill Christiansen** – Director of Programs, Alliance for Water Efficiency
- **Julius Duncan** – Environmental Engineer, EPA WaterSense
- **Deb Lane** – Water Resources Analyst, City of Santa Rosa

**ORIGINAL DATE:**  
**JUNE 4, 2019**

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[Webinar Recording on YouTube](#)

## WEBINAR SUMMARY

In the introduction, Mr. Christiansen provided an update on the Alliance for Water Efficiency's (AWE's) Outdoor Water Research Initiative. AWE has been researching water savings data that could lead to the direct implementation of programs. The reports are posted on the AWE website (<http://www.allianceforwaterefficiency.org/research.aspx>). The resources for the Landscape Transformation Study can be found online and include an analytics report and market analysis report. The Sustainable Landscapes Utility Program Guide is based on the findings of the AWE Landscape Transformation Study Analytics Report. It is an AWE member-only resources that focuses on utilities just getting started or those enhancing existing programs.

Following that, Mr. Duncan went over how WaterSense can provide a link between water efficient design and stormwater management. Stormwater management practices, such as green infrastructure, are often overlooked as ways to improve water efficiency. Diversity in the landscape can include using rain gardens that collect rainfall and using climate appropriate plants that can withstand water stress helps to limit irrigation. Rain gardens need irrigation in the establishment period of the plants, and efficient irrigation components should be used to reduce water loss.

**New WaterSense Materials at**  
<https://www.epa.gov/watersense>

- [It's Time to Start a Sprinkler Spruce-Up brochure](#)
- [Irrigation controller brochure](#)
- [Microirrigation guide for professionals](#)

## FEATURED SPEAKER: DEB LANE

The City of Santa Rosa, located in northern California, completed a grant funded sustainable education garden project at its City Hall campus. Rather than looking at stormwater as a nuisance that needs to be transmitted offsite quickly, they looked at stormwater as a resource and designed features in the landscape that mimic the natural functions that occur in an undeveloped site. Known as Low Impact Development (LID), these features slow the flow of stormwater runoff, help filter and clean the runoff, and promote infiltration into the ground. By using a collaborative approach between the City's Water Efficiency and Stormwater experts, they designed and constructed an educational garden that uses stormwater as a resource, is low water use, and provides multiple environmental benefits. The project also exemplifies how to retrofit an existing facility, thus keeping construction costs down.

The Santa Rosa Sustainable Education Garden project included several elements:

- Rainwater harvesting to irrigate a portion of the landscape
- Rooftop water redirected to bioswales
- Permeable concrete in all walkways and outdoor gathering area
- Bioretention in the parking lot
- High efficiency irrigation
- Low water use and California Native plants
- Educational signage throughout the project area
- Resources available at <https://www.srcity.org/cityhallgarden>.

### Successes and Lessons Learned

At the City Hall Sustainable Educational Garden, a rainfall collection tank is used to collect water from the rooftop. Overflow from the tank is directed to a bioswale which traverses the landscape helping the runoff infiltrate back into the soil. The operating volume of the tank is 1,200 gallons. The system includes a pump along with flow sensors which provide data that allows staff to calculate the amount of City water that is saved due to the use of rainwater to irrigate the landscape. The team learned that because of limited industry knowledge and resources, and the challenge of retrofitting an existing building, it is important to carefully consider the design approach for a rainwater collection system and be aware of the level of engineering that will be necessary on a complex system.

For landscaped areas that required irrigation, they installed a robust water efficient drip system for shrubs and low volume bubblers on trees to reduce the amount of water that would be wasted due to over spray and runoff. A WaterSense labeled weather-based irrigation controller adjusts the irrigation schedule based on weather and site conditions. Reducing summertime irrigation runoff also helps to keep pollutants out of the storm drain system which leads to the City's creeks and eventually to the Pacific Ocean.

The main City Hall parking lot has 4 storm drains. Rather than removing them and changing the grade of the parking lot (which would be very expensive), they installed lined trenches that are filled with a permeable rock base that directs the parking lot runoff from each storm drain to bioretention planting areas which were dug out and filled with structural soil. Permeable concrete rings were installed around each storm drain to collect the parking lot runoff during rain storms. The runoff flows through the permeable concrete to the bioswale areas via the lined trenches. The plants in the bioretention areas clean the runoff before it soaks into the ground. During large storms, the bioretention areas fill up and then the runoff flows over into the original storm drain system. This innovative design was done by the City's Supervising Engineer in the Stormwater and Creeks section. The permeable concrete rings ended up breaking down due to the amount of wear and tear so the City removed the concrete and installed metal grates which are performing well.

### CONCLUSION

Through collaboration between the Water Efficiency and Stormwater sections, the City of Santa Rosa was awarded over \$800,000 in grant funding to design and build an innovative sustainable educational garden at their City Hall campus. The project demonstrates the nexus of water efficiency and stormwater management. Sustainable landscapes can not only save water but also provide water quality benefits. The project is beautiful and functional by saving and cleaning water, and provides a community gathering area that also functions as an outdoor classroom.

## **SPEAKER QUESTIONS AND ANSWERS**

### **Q: Was there any backlash from removing trees?**

A: Ms. Lane responded that over the course of the project they planted many more trees than were removed. Additionally, some of the removed trees were stressed or diseased. Planting more trees will help to increase the overall canopy area.

### **Q: How affordable would this process be for homeowners?**

A: Ms. Lane noted that retrofitting a residential landscape is a lot more affordable than you might think. This was a highly engineered and designed project, but they would like to see more demonstration project work done in the residential area. As a place to start, she recommended looking at the free landscape design templates provided by the Sonoma-Marin Saving Water Partnership that were created to help with rebuilding efforts after the 2017 fires in Sonoma County (<http://www.savingwaterpartnership.org/landscape-design-templates/>) There are low-cost LID design details available to use such as redirecting downspouts and building a rain garden.

### **Q: Who maintains the landscape once it is completed?**

A: During the project, they appropriated funds for maintenance. Ms. Lane emphasized that it is very important to have a management plan in place before you start a project like this to maintain landscape health and fix any issues that may come up.