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Eugene Water & Electric Board

REDUCING PEAK HOUR DEMAND WITH MSMT-MPR SPRINKLER NOZZLE RETROFITS

Eugene Water & Electric Board

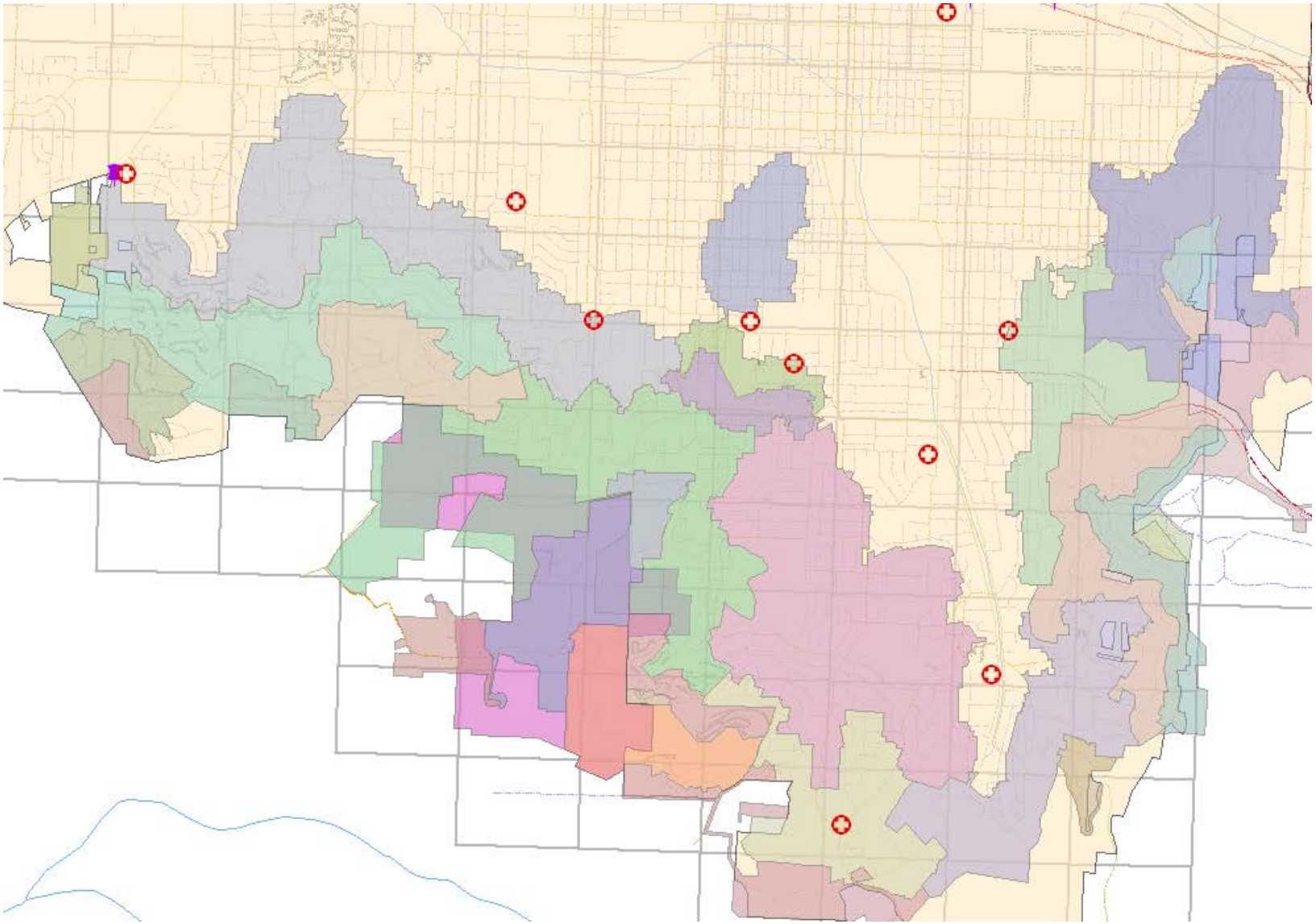
REDUCING PEAK HOUR DEMAND WITH NOZZLE RETROFITS: THREE YEAR EVALUATION

THURSDAY, OCTOBER 3, 2013

Introduction

- Many neighborhoods in Eugene are in hills to south of town.
  - Some pressure zones are supplied water by reservoirs
  - Some supplied only by pumps

EWEB Pumping Zones



Introduction

- In 2005, recorded water meters to determine water usage patterns
  - Most residents have sprinkler systems running from 5:00 a.m. to 7:00 a.m.
  - Exceeding capacity of domestic pumps
  - Decided to implement extensive customer education campaign in neighborhoods to reduce peak hour demand
- Highest demand for water during one hour of the day = Peak Hour Demand

Pilot Year 2008

- Small sample of residential and commercial landscapes retrofitted with MSMT-MPR nozzles
- Results mixed, needed more data

2009 Study Year

- Promotion to customers, offered nozzle retrofits to customers.
  - Initially offered to all customers, to gather statistically valid sample
- Multi-Stream Multi-Trajectory Matched Precipitation Rate sprinkler nozzles (MSMT-MPR)

Study Year 2009: Study Parameters for Participation

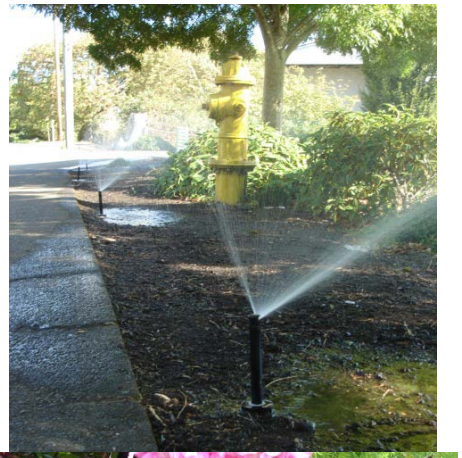
1. Customer Contact EWEB
2. Set data logger on water meter
3. Customer schedule audit with contractor
4. Contractor perform audit (lawn areas)
5. Purchase and install nozzles

Study Year 2009: Study Parameters for Participation (continued)

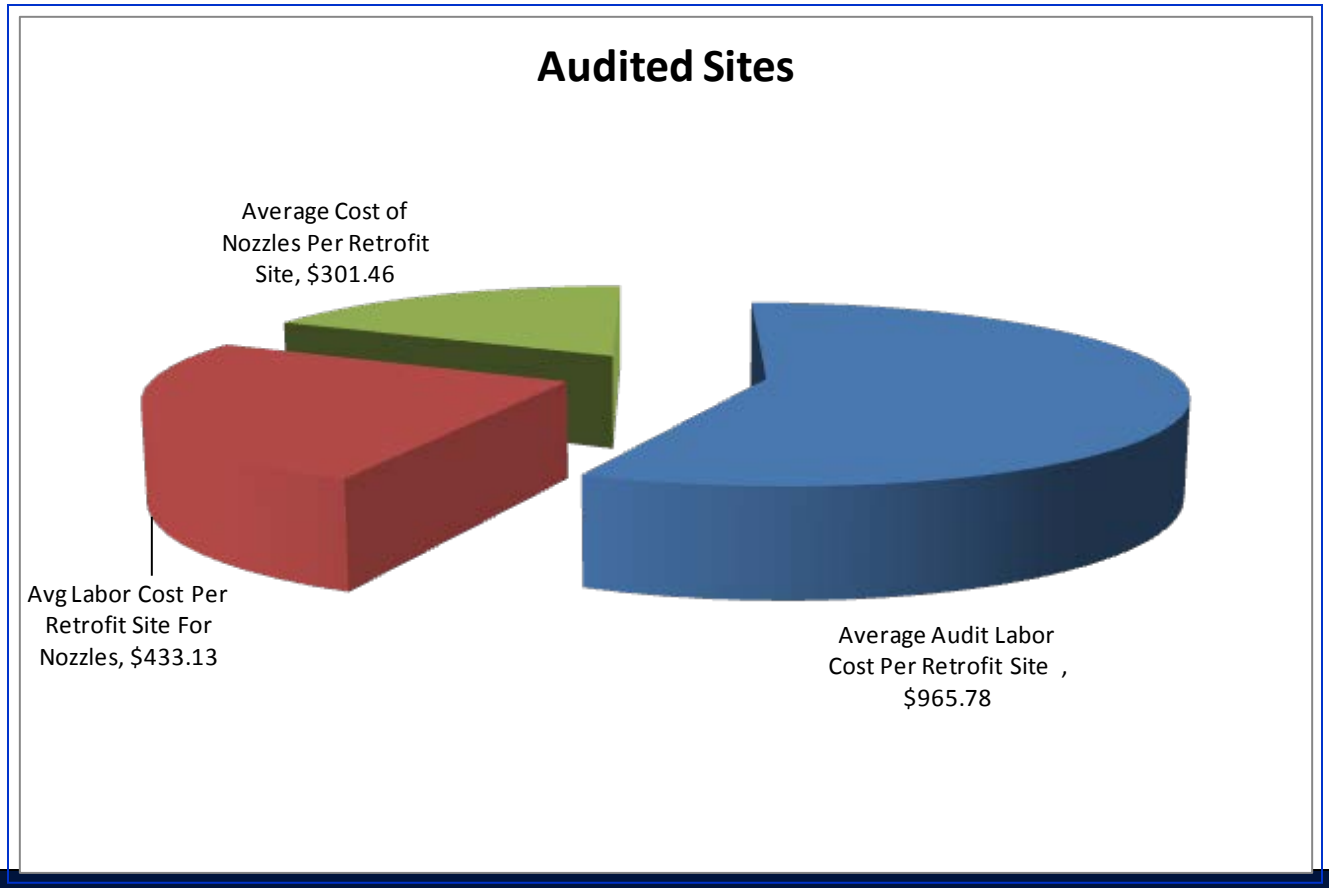
6. Invoice submitted
7. Schedule post audit with EWEB
8. Assist customer with reprogramming controller to water outside 5:00 a.m. to 7:00 a.m.
9. Pay contractor for work performed

Implementation Year: 2009

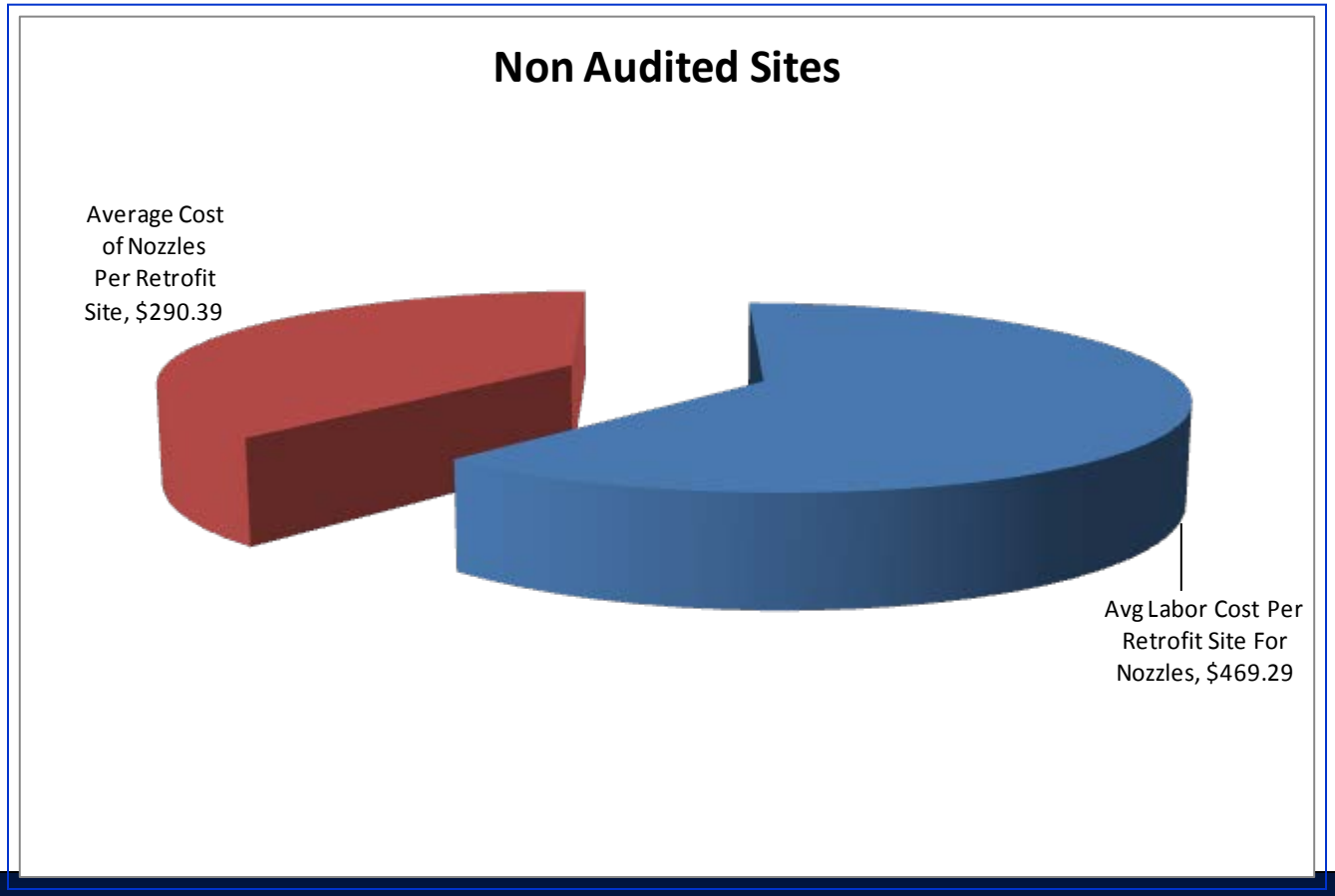
- 131 sprinkler zones retrofitted with MSMT-MPR nozzles
- 17 residential
- 6 Commercial (small landscapes)



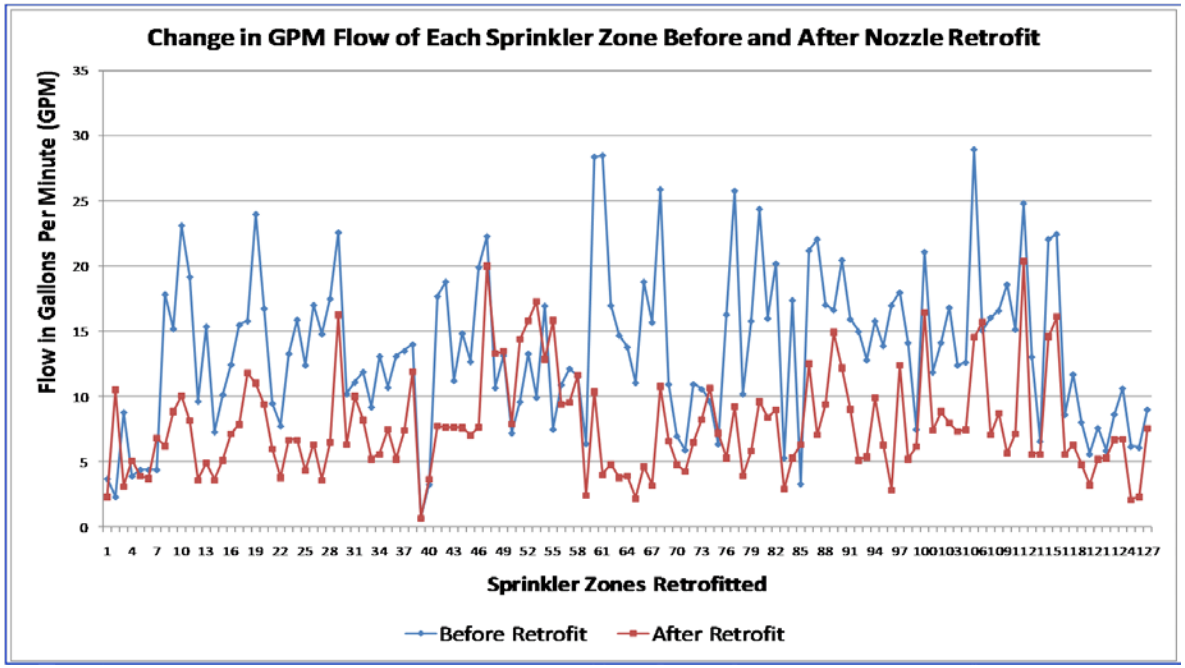
Costs


Audited Sites
Average Cost of Nozzles Per Retrofit Site, $301.46
Avg Labor Cost Per Retrofit Site For Nozzles, $433.13
Average Audit Labor Cost Per Retrofit Site , $965.78

Costs continued

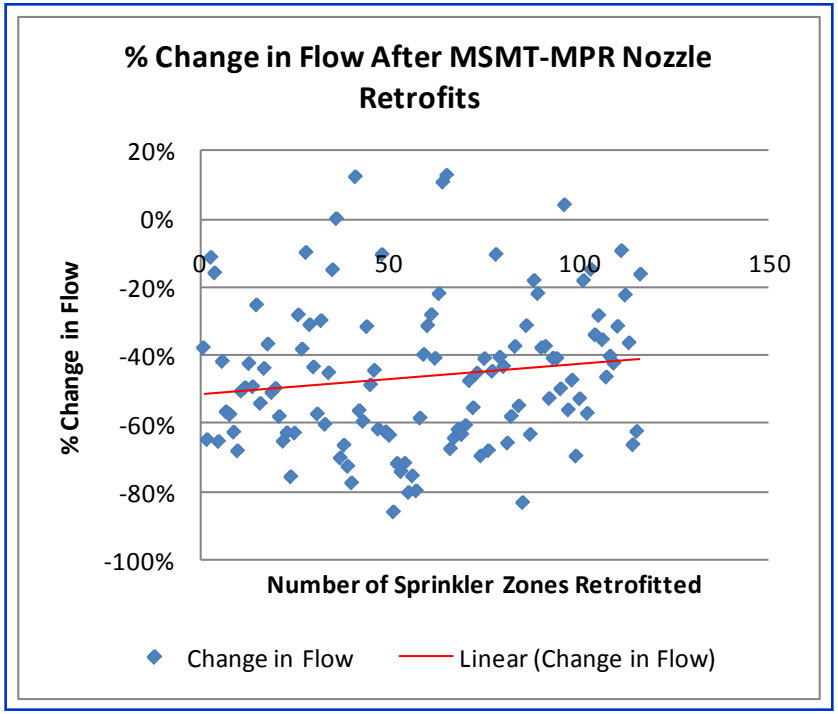


Results of Flow Changes



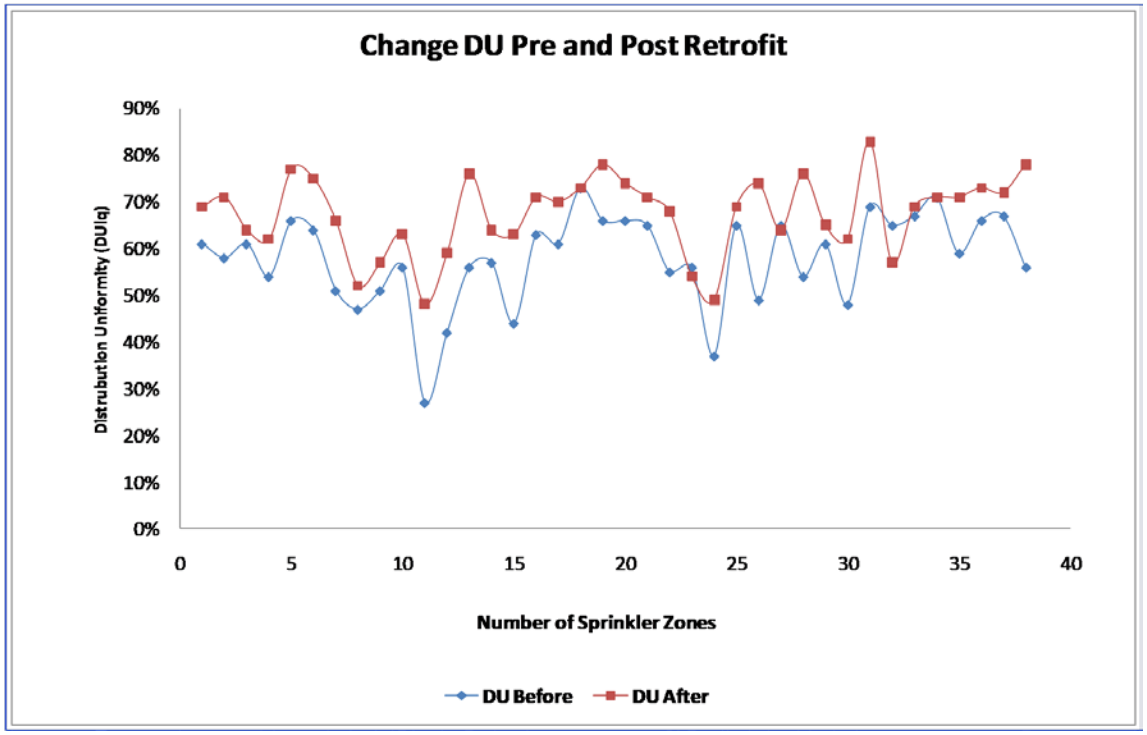
- Average gallon per minute (gpm) flow decreased 43%

Results of Flow Changes



- Average change in gallon per minute (gpm) flow was decrease of 43%

Improvement in Distribution Uniformity



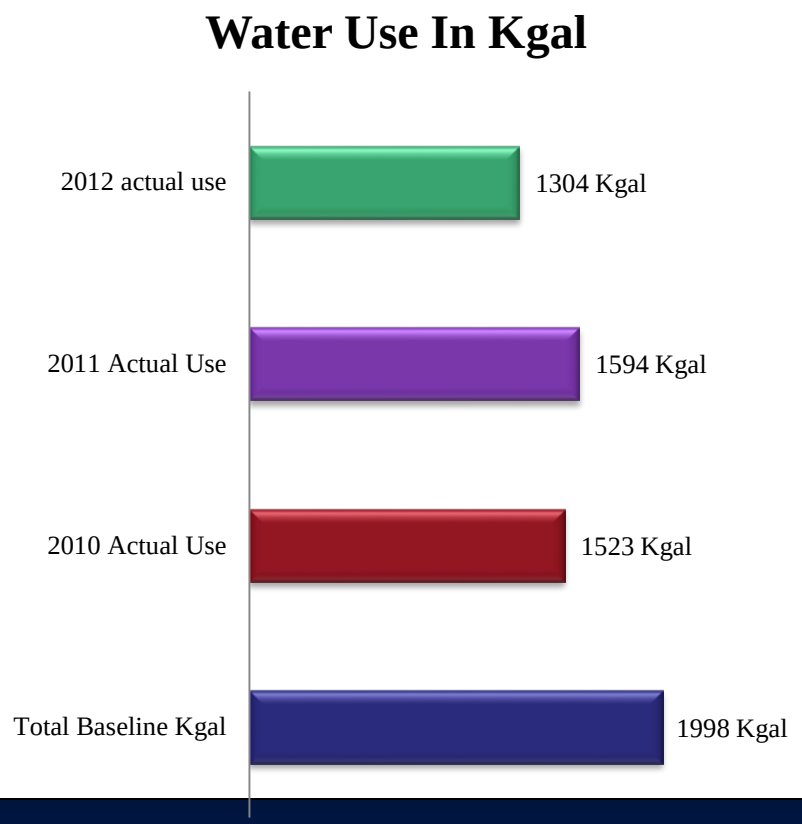
- Distribution Uniformity improved on average 10% on each retrofitted sprinkler zone
- Park strip lawns proved difficult to audit accurately

Evaluation Years 2010-2012

- 2010 – interns recorded water meters
  - Measure GPM
  - Confirm customer watering outside 5:00 a.m. to 7:00 a.m. watering window.
  - Customers were content with new watering schedule. Did not return to old schedules

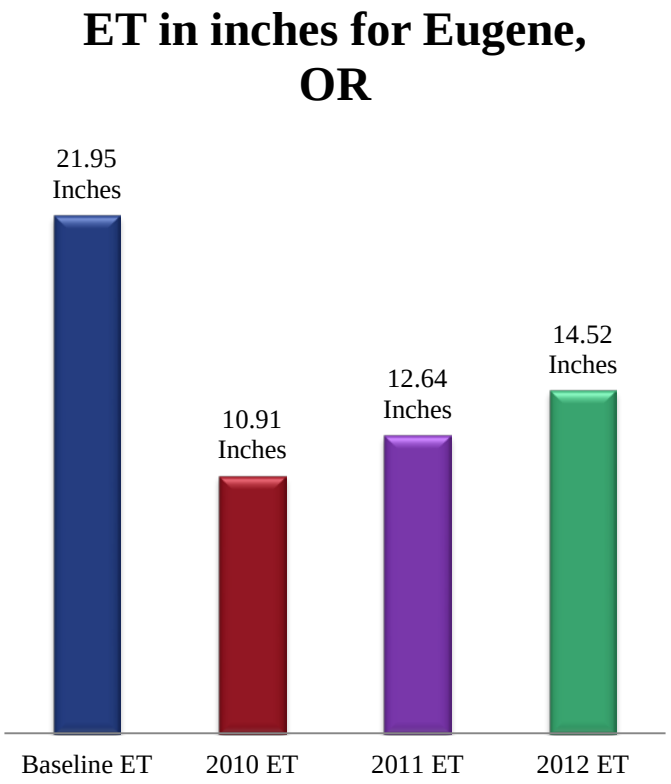
Water Savings (compared to 2006-2008 average)

- Secondary interest
- Baseline = average ET for 2006-2008 (cool season turf)
- In 2010 water use reduced 24%
- In 2011 water use reduced 20%
- In 2012 water use reduced 35%



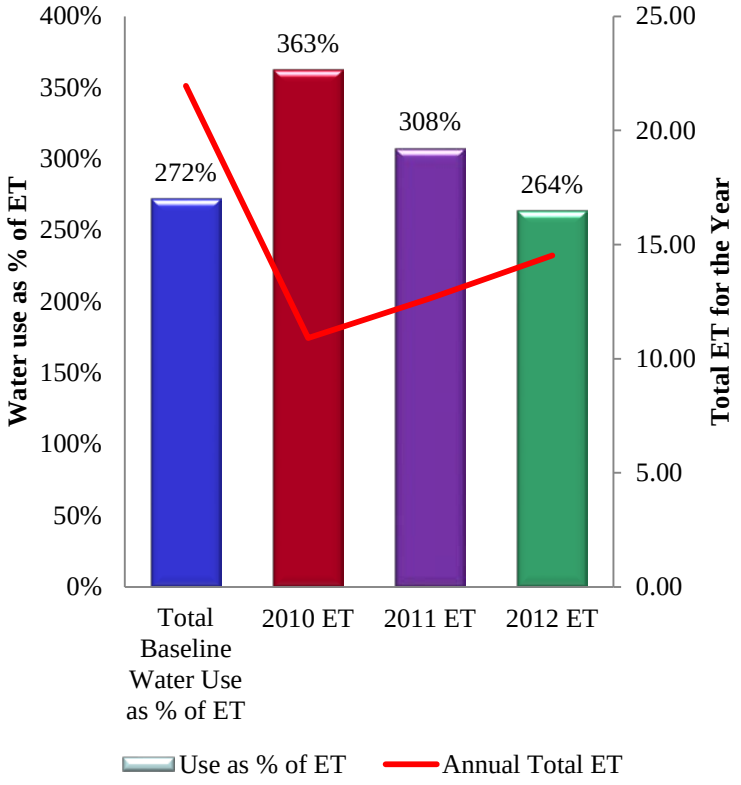
Water Savings cont.

- Dramatic decrease in ET for 3 years of study
- Reduced water consumption is result of lower than average annual ET



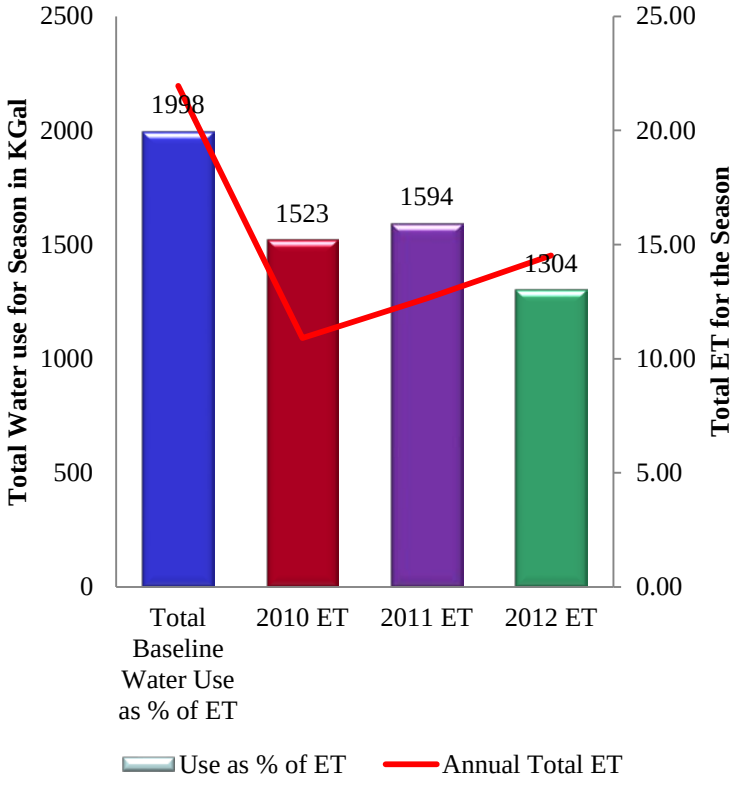
Water use compared to ET

- Water use increased as a % of ET because of decrease in annual ET and not equal decrease in total Kgal usage



Total Water Use Compared to ET

- Total Kgal use for season decreased each of three study years compared to baseline average
- ET for the year decreased as well



2011-2013

- Offered rebates of $500 to customers to retrofit sprinkler nozzles to efficient low flow nozzles.
- Nozzles must have < 1.0 gpm flow

- 2011 - 6 Customers
- 2012 - 1 customer
- 2013 - 2 Customers

Conclusions

1. Gallons per minute flow is reliably reduced by 43%
2. Distribution uniformity of sprinkler system is improved by 10%
3. Retrofits in this study did not save water – but met utility needs.

Next Steps

- Continue to offer MSMT-MPR nozzles as rebate to customer in neighborhoods effected by Peak Hour Demand

Contact Info

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