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Increasing the Impact of Utah State University's Extension Water Check Program With 5-Second Metering

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Increasing the Impact of Utah State University’s Extension Water Check Program with 5-Second Metering

Study Goal – Increase the volume of water saved by the Utah State University (USU) Extension landscape Water Check program because outdoor water use is the largest component of residential use with the largest opportunity to reduce use. We used 5-second water use data collected with Flume Smart Home Water Monitoring devices (Figure 1) at residential homes before and after a Water Check (Box 1; Figure 2) to answer four questions:

1. How much water did households save?
2. Which Water Check recommendations did participants implement?
3. Why did participants implement some recommendations and not others?
4. How to further reduce landscape water use?

Results – 59 Households collectively reduced water use by 626,000 gallons—1.9 acre-feet. Significantly different than no savings with 99.998% confidence (Table 1).

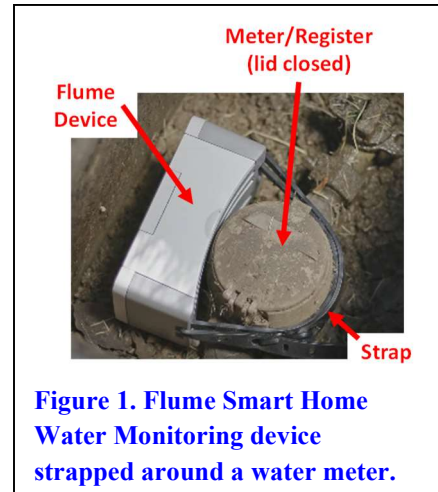
Participants reduced their use by:

1. **Reducing** water application to more closely match their landscape water budget.
2. **Reducing** the duration of irrigation events and number of irrigation events per day.
3. **Increasing** days between irrigation events.

Large water users reduced use closer to their budgets. Small users started below their budgets and further reduced use. Landscape water budgets also declined seasonally.

Findings were similar across the two participating cities – Logan and Hyde Park, Utah.

We implemented seven suggestions to improve the Water Check program (Box 2, next page).



Box 1. Study Characteristics

- **Time:** July to October, 2022
- **Locations:** Logan and Hyde Park, Utah
- **Participation:** 78 Flumes installed, 74 Water Checks completed, 59 households with 2+ weeks data collected, 9 follow-up interviews.
- **561 weeks of data collected:** 189/372 weeks before/after a Water Check.

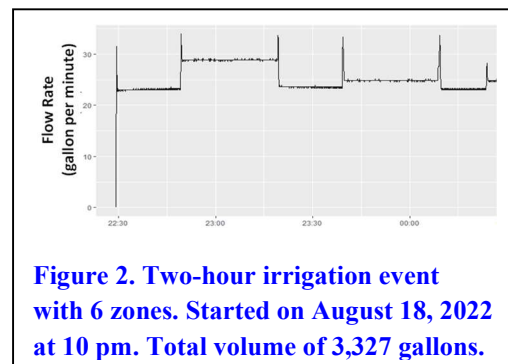


Table 1. Reductions in water use

Comparison	Volume (1,000 gal.)
Pre Use minus Post Use	626
Pre Use minus Pre Budget	124
Post Use minus Post Budget	52
Pre Budget minus Post Budget	554

Next Steps

1. We expect more reductions if Water Checks are:

- Completed earlier in the summer.
- Targeted towards the largest water users.
- Continue with monitoring in 2023.

2. Share results with Logan City, Hyde Park, Utah agencies, & Water Conservancy districts.

3. Produce 2 minute video.

4. Present findings at a national conference.

5. Identify how weather conditions effect water savings—conduct follow-on *controlled* pre/post

Water Check study where ~50% of participants *do not receive* a Water Check.

Box 2. Recommendations to improve Water Check Program

- Include follow-up visit.
- Assess drip irrigation zones.
- Work with home-owner associations.
- Add a 1-page summary to report.
- Share example water-wise landscapes.
- Share contact information for landscape contractors.
- Connect participants to city staff.

Study Team

- **Utah State University:** David E. Rosenberg, Mahmud Aveek, Camilo Bastidas, Jeffery S. Horsburgh, Belize Lane, Kelly Kopp.
- **WaterDM:** Peter Mayer.
- **Flume, Inc.:** Joe Fazio.

Informational Resources

Contact: Dr. David E. Rosenberg, Phone: (435) 797 8689, E-mail: david.rosenberg@usu.edu

Dataset and Code Repositories:

- <https://www.hydroshare.org/resource/fe0377e960b741c4a52dc6ea49db7d80/>
- <https://github.com/cjbas22/HelpUSUExtensionP>.

Websites: <https://uwrl.usu.edu/water-check-study>.

Additional Results

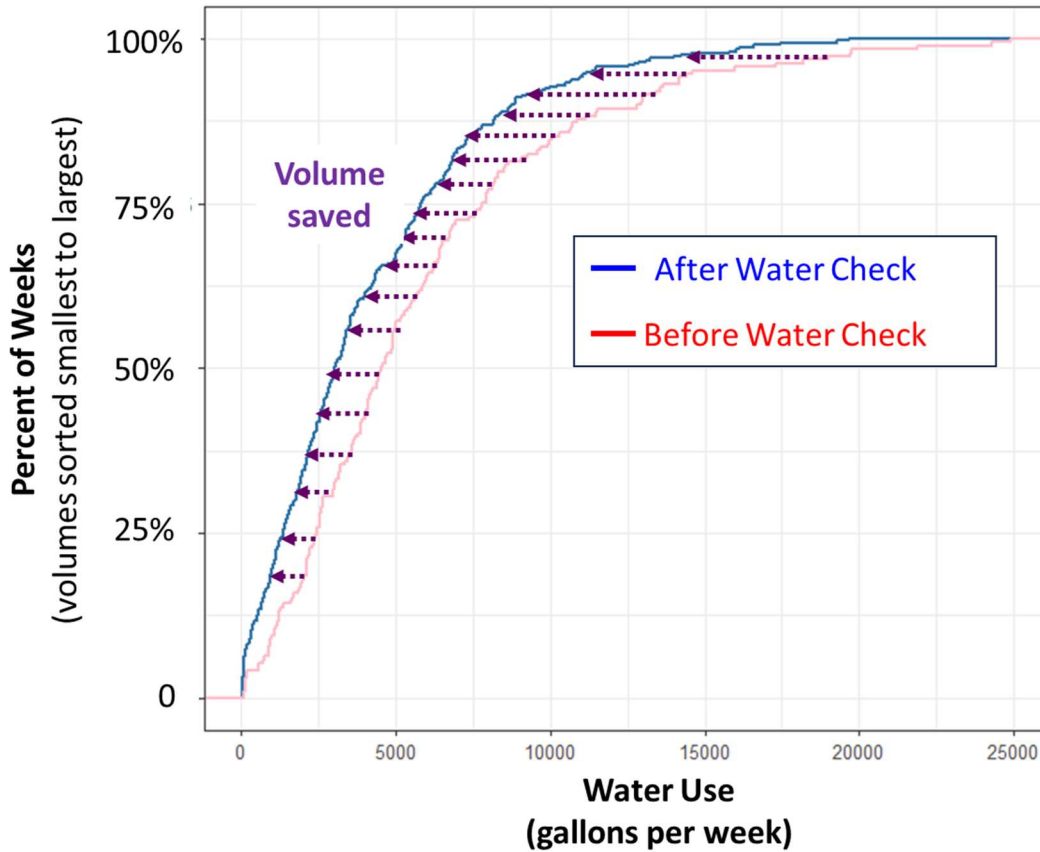


Figure A. Weekly water uses before (red curve) and after (blue curve) a Water Check are sorted by volume smallest to largest. The blue curve shifted left to lower weekly water volumes relative to the red curve (purple dotted arrows). The shift left indicates 626,000 gallons collectively saved by the 59 households that had 2 or more weeks of data before and after the Water Check. The water volume saved is greater than zero with 99.998% confidence.

Table A. Change in median irrigation application depths

Sample (size)	Application Depth (inch)			Significance
	Before	After	Decrease	
Combined (59 hh)	1.0	0.7	0.3	99.998%
Hyde Park (34 hh)	1.0	0.72	0.28	99.3%
Logan (25 hh)	0.86	0.59	0.27	99.9%