This presentation premiered at WaterSmart Innovations

watersmartinnovations.com

watersmart
INNOVATIONS

SNWA Smart Controls Exemption Study
A First Look

Kent Sovocool and Mitchell Morgan
Southern Nevada Water Authority

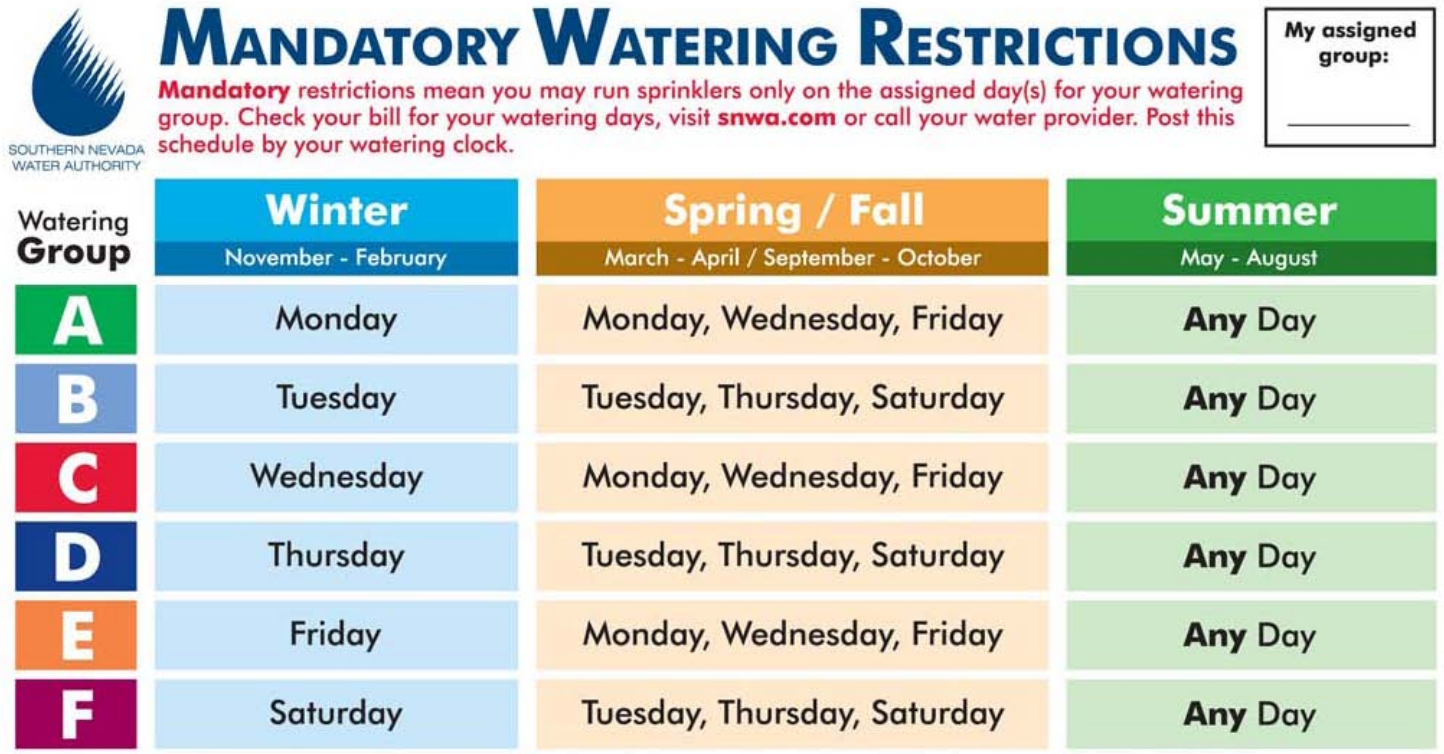
What are smart irrigation controllers?

- Devices that in some way modify irrigation based on sensed environmental variables.
- Could for example include controllers with onsite ET or soil moisture sensors, devices that receive such a signal from a remote weather station, etc.
- Belief is smart controllers save water in most circumstances.
- Subject of much interest right now in water conservation (SWAT, WaterSense, California Controller Study, utility rebate programs, local UNLV Study).

Smart controllers and Watering Restrictions

- Some in the green industry claim smart controllers work best when not inhibited by watering restrictions.
- Most jurisdictions do not have exemptions to watering restrictions for smart controllers. WaterSense has struggled with what features should go into its spec to assure smart controllers work with such requirements.
- Locally this was brought up during the early drought in advance of SNWA's watering restrictions.
- Specific issue was Day-of-Week restriction.

SNWA Day-of-Week Retrictions



SOUTHERN NEVADA WATER AUTHORITY

MANDATORY WATERING RESTRICTIONS

Mandatory restrictions mean you may run sprinklers only on the assigned day(s) for your watering group. Check your bill for your watering days, visit **snwa.com** or call your water provider. Post this schedule by your watering clock.

My assigned group: _____

Watering Group	Winter November - February	Spring / Fall March - April / September - October	Summer May - August
A	Monday	Monday, Wednesday, Friday	**Any** Day
B	Tuesday	Tuesday, Thursday, Saturday	**Any** Day
C	Wednesday	Monday, Wednesday, Friday	**Any** Day
D	Thursday	Tuesday, Thursday, Saturday	**Any** Day
E	Friday	Monday, Wednesday, Friday	**Any** Day
F	Saturday	Tuesday, Thursday, Saturday	**Any** Day

Compromise (and a Study is Born)

- SNWA purveyor jurisdictions agreed to exercise administrative discretion in not enforcing Day-of-week provision against properties that had smart controllers until July 1st, 2010 for properties that agreed to:
  - Participate in an SNWA research study on the topic (no signed participant agreement, no waiver).
  - Agree to detailed monitoring of water use and other variables by SNWA.
  - Abide by all other water waste restrictions. These include Time-of-day restriction, prohibition of runoff, etc.

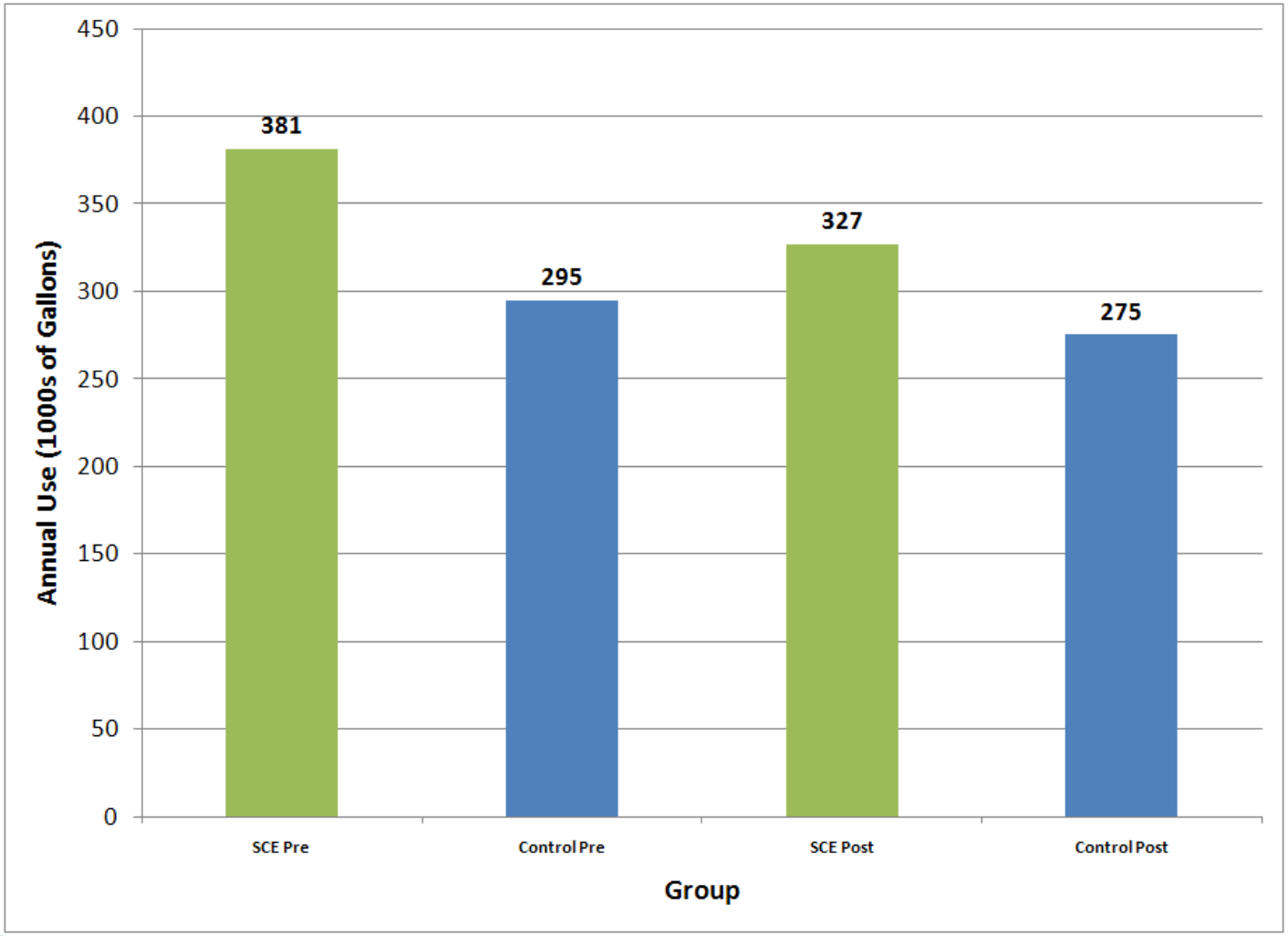
Challenges

- Lack of public interest in smart controllers.
- Lack of interest in watering exemption for those few that have smart controllers.
- Result – relatively small sample.
- Studies borne of compromise, while sometimes needed, often lack ideal design elements (example – control group recruitment).
- Self-selection bias (exists in most conservation studies, but “opposite” in this case).
- Strong background community-wide savings. This tends to obscure potential effects.

Analytical groupings

- Group with Smart Controllers that received the exemption (N=51; 17 properties X number of valid annual consumption points).
- Control Group without Smart Controllers, but same neighborhood and other characteristics (N=153; 51 properties X number of valid annual consumption points).
- Group with Smart Controllers that did not receive the exemption (future).
- Large Group of properties used to chart compliance with Day-of-week restrictions (future).

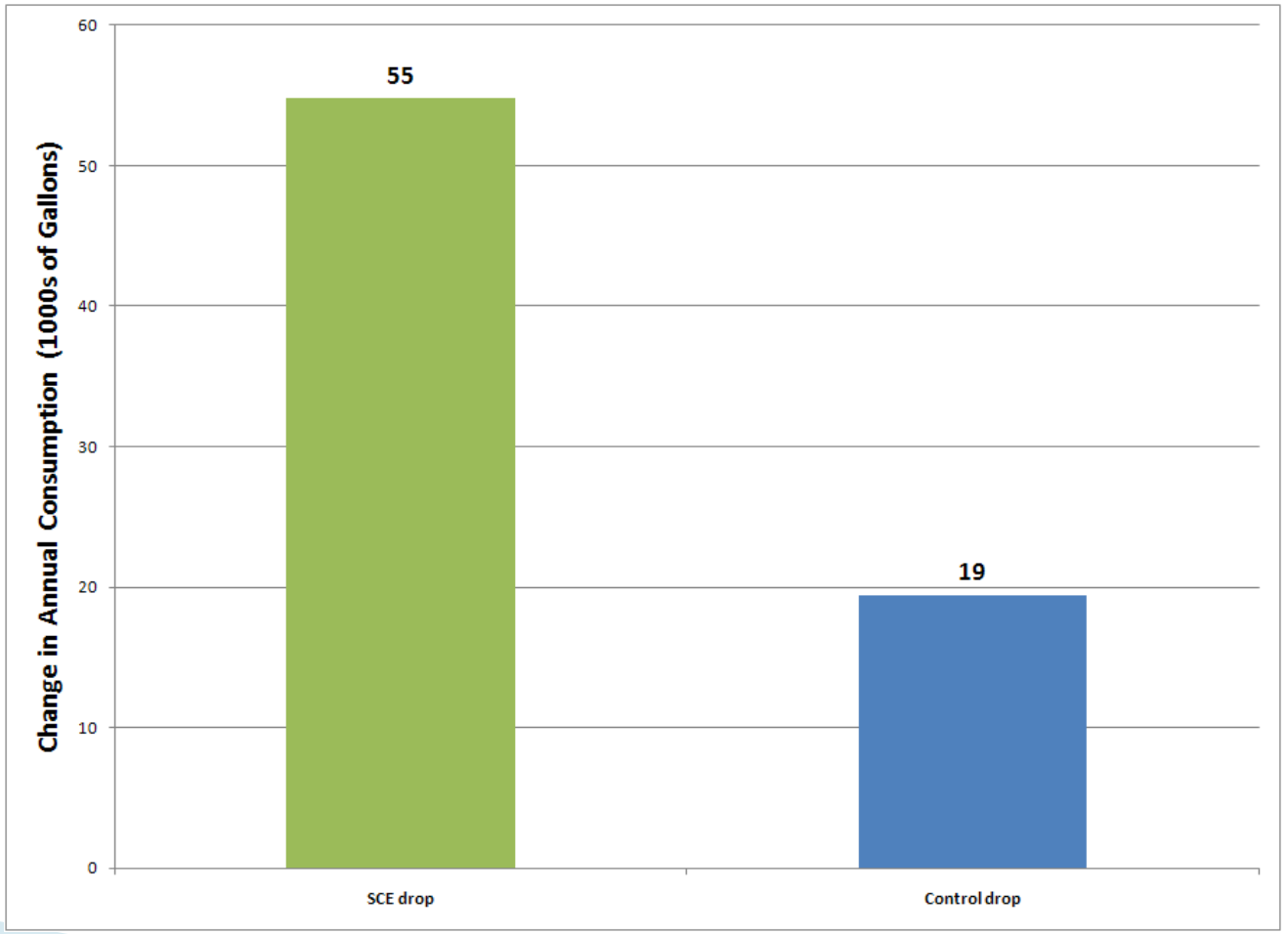
Results – Mainmeter Consumption



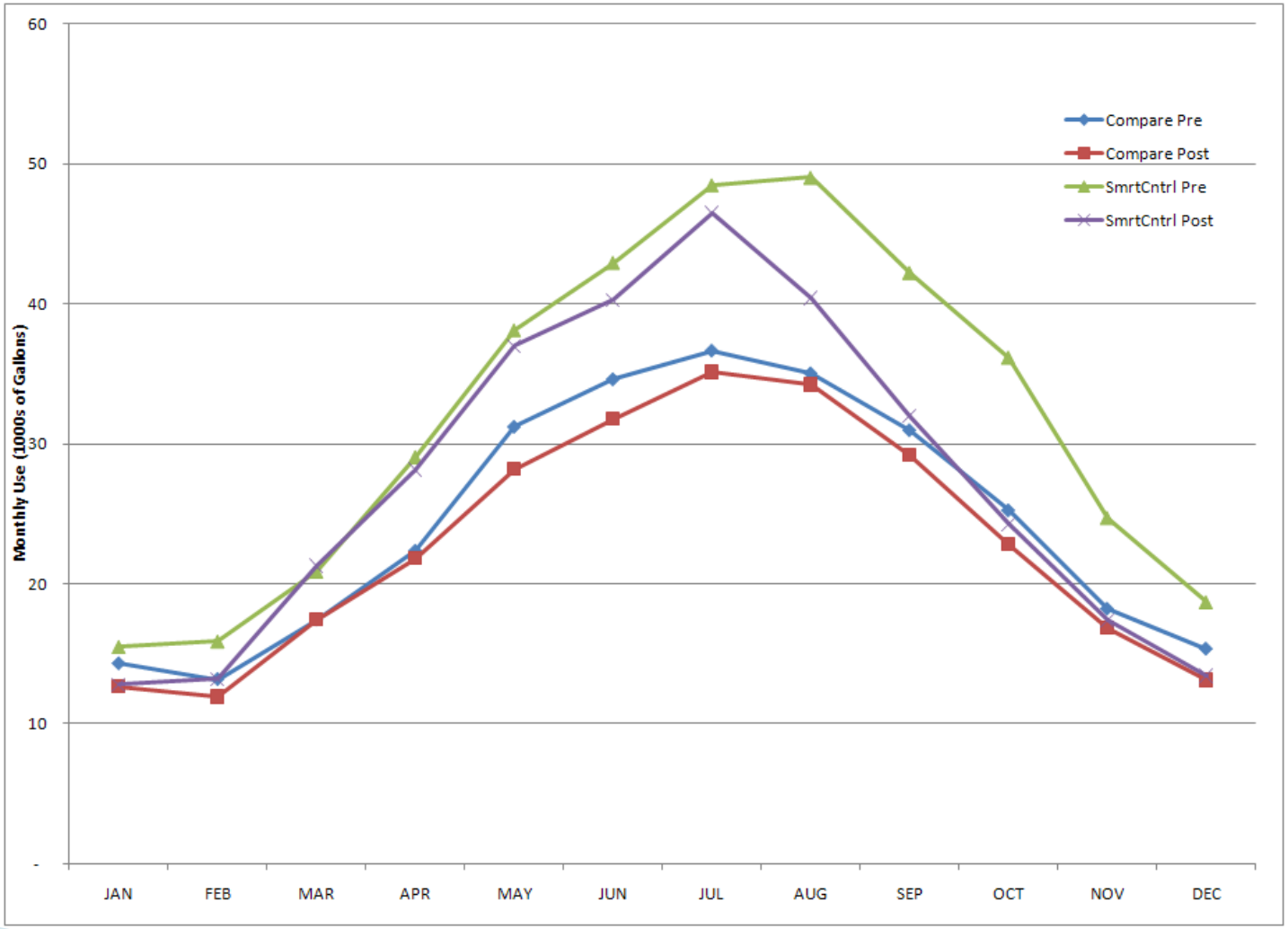
Results – Differences Analysis

That is, is the 14% drop in the SCE group different than the 7% drop In the background conservation rate?

Statistically the answer at this point appears to be “No” those are not different drops (p=.090), but the possibility of a trend exists.



Results –Monthly Consumption



Early Conclusions

- There is a significant tendency towards those with higher levels of consumption selecting smart controllers (i.e. there is “reverse” self-selection bias in this study).
- Both the smart controls exempt group and the control group show significant drops in consumption.
- In the post period there is no statistical difference in consumption between the groups.
- There is no difference, statistically in the amount of the drop between the two groups.

Early Conclusions

- Smart controllers with Day-of-Week exemptions don't save more than the background population on average, though. .
- These may be an avenue for saving water in the high use population. More research needed.
- Further analyses (and sample sizes!) are needed. Possibilities include looking at those who have smart controls (but declined to get the exemption), looking at the whole population, and/or looking at just high users.

Questions?