

Water Supply: Rio Verde

Krista Lawless, Shawn Berry,
Ben Oaks and Jessica Davidson


Project

- Rio Verde Community
 - Water Supply: Residential Consumption
 - Analyze Data- Recommend initiatives to invoke behavior change
 - What are other Audobon certified cities doing to conserve water supply? How?

Progress

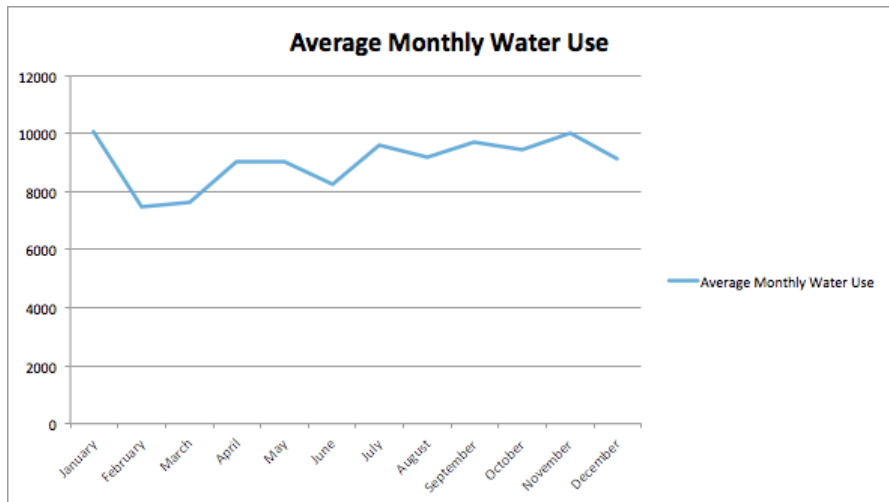
- Overview: Steps of the research project.
- Recorded observations on-site, obtained data from local utility and met with community leaders to discuss focus
- 2 site visits, numerous phone calls and emails

Comments on Data

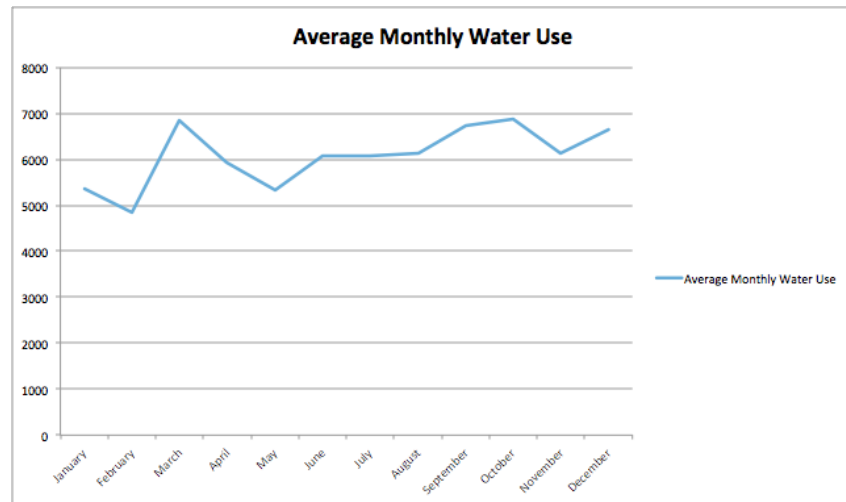
- Inconsistent collection dates for monthly water usage
 - Multiple collections in one month for some houses
 - Some houses only have data for latter months
 - Increased number of households each year
 - Very high standard deviation for monthly household consumption averages
- 

Data

2008



2015



- Peaks have dropped significantly

Tool

	2008	2009	+/-	2010	+/-	2011	+/-	2012	+/-	2013	+/-	2014	+/-	2015	+/-
January	17818491	13306670	-4511821	16760730	3454060	13582750	-3177980	15778392	2195642	13341420	-2436972	13996760	655340	14273214	276454
February	13246340	15102920	1856580	12269720	-2833200	15268580	2998860	14422174	-846406	16284309	1862135	14561030	-1723279	12909193	-1651837
March	13482376	14135870	653494	14297421	161551	16795784	2498363	15148740	-1647044	14686270	-462470	14639002	-47268	18286302	3647300
April	16046045	16831685	785640	15951509	-880176	15770166	-181343	18273158	2502992	18004530	-268628	18146251	141721	15809463	-2336788
May	16019185	14984778	-1034407	15290119	305341	16374030	1083911	14541438	-1832592	15367480	826042	14629069	-738411	14222705	-406364
June	14652081	15297242	645161	17926441	2629199	16159830	-1766611	15103362	-1056468	14453620	-649742	17392577	2938957	16211998	-1180579
July	16985629	15558155	-1427474	16073496	515341	16412720	339224	17716950	1304230	18728844	1011894	16521786	-2207058	16225854	-295932
August	16289820	16226880	-62940	19020925	2794045	17704933	-1315992	18595310	890377	16357300	-2238010	17009238	651938	16381657	-627581
September	17234070	17567200	333130	16559115	-1008085	16207958	-351157	15265000	-942958	18113930	2848930	17958796	-155134	17962458	3662
October	16695940	18100200	1404260	16972554	-1127646	15932747	-1039807	19229671	3296924	16529620	-2700051	15346021	-1183599	18329261	2983240
November	17703800	17180626	-523174	17790321	609695	20009106	2218785	16978074	-3031032	16022872	-955202	15270630	-752242	16363837	1093207
December	16216510	18767774	2551264	16575899	-2191875	15100847	-1475052	14655486	-445361	17327070	2671584	17023880	-303190	17777689	753809
TOTALS	192390287	193060000		195488250		195319451		195707755		195217265		192495040		194753631	

- Plus/Minus chart of total water consumption
- Used to see trends in consumption as time passes

Proposed New Tracking Tool

[illegible]

Other Metrics

- How many people per household?
- How long do people take in the shower?
- How often do they do laundry?
- Do they have a swimming pool?
- Total population per month
 - Takes into account “snowbirds” and others who live here only part of the year
- Take advantage of existing data
 - Can sort data and determine highest consuming households per year/month

Survey Questions

1. Have you received a SRP home performance with energy star audit on your home with free energy saving giveaways?
2. Would you be interested in a home energy audit to find ways to lower your home energy usage and make your home more comfortable?

If yes, please put your contact information below to receive a coupon code for \$50 off the \$99 home energy audit, a large reusable bag, toilet tank bank and 5 LED light bulbs also qualifying for rebates.

1. 3. How many water efficient appliances do you have in your home?
2. 4. Do you have natural landscape in your yard?

If so, how often do you water?

1. 5. Do you run the dishwasher only when it is full?



Results and Findings

- Intellectual / Scientific lessons-learned?
- Personal & Group lessons –learned?
- How are these lessons-learned linked to the Key Competencies in Sustainability?



From Audubon International Resources:

Residential:

Reduce water use by air-powering shower using low-flow showerhead, low-flow toilet & faucet aerators.

Install water conservation irrigation equipment such as soaker hoses or drip irrigation, rain collection systems, Audubon Cooperative Sanctuary

Shut off water during teeth brushing & shaving. Take showers of 5 minutes or less. Run the dishwasher & clothes washer on full loads



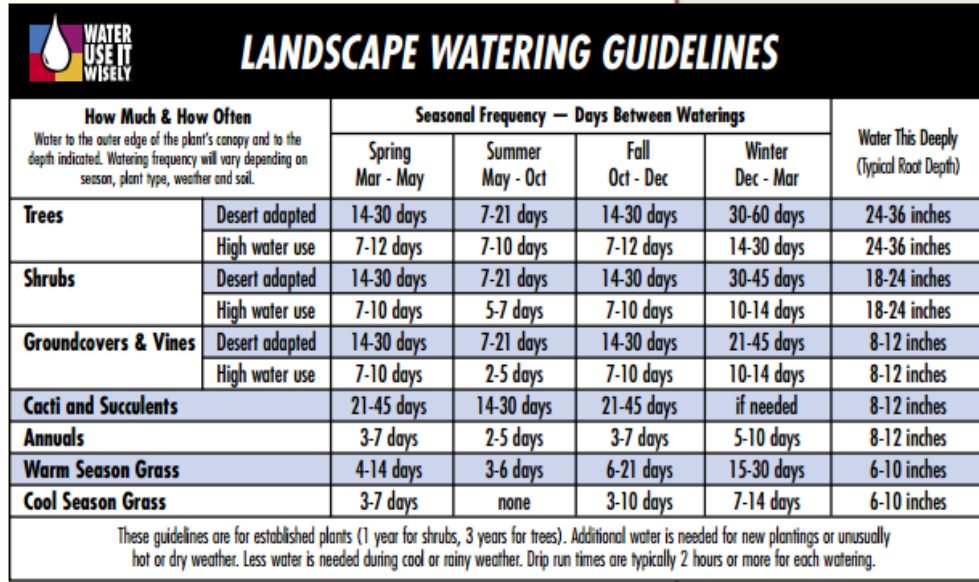
Residential

Before 10 AM or after 6 PM

Car washing w/ bucket & hose with shutoff valve. Fines 50 - 500 dollars

Ask for suggestions on saving water via newsletter & incentivize

Gets residents thinking about current & future consumption behaviors



From Audubon International Resources:

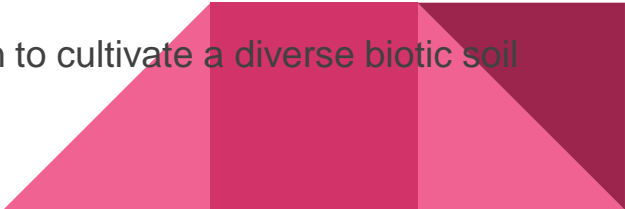
Golf Course:

Maintain mowing heights at levels that can be maintained day-to-day basis without stressing turf/maximizing chemical inputs.

Inventory soil types & assess conditions (soil structure, nutrient levels, organic content, compaction, water infiltration)

Improve soil health by

amending organic content, aerating, & improving water infiltration to cultivate a diverse biotic soil community.



Suggestions

Golf Course

\$0.25-\$1 per square foot for turf removal and/or adding low water use plants

Global Syn-Turf in Rio Verde, AZ <http://www.globalsynturf.com/artificialgrass/rio-verde/5311414>

Hand water dry spots with hose vs sprinklers (part circular sprinklers)

Add Water Ambassador position to board

Suggestions

Turn off during high evapotranspiration times

Step 1. The Arizona ETo estimate is 0.33"

Step 2. Select the Kc value appropriate late for your turf.

(Assume a high quality warm season turf: Kc = 0.76)

Step 3. Determine turf ET value.

$$ET = Kc \times ETo$$

$$= 0.76 \times 0.33$$

$$= 0.25" \text{ Daily turf water use}$$

Landscape Watering and Maintenance Calendar

January	Flush your irrigation system and check the filter.
February	Move emitters out to the dripline of all trees and shrubs as they grow.
March	Adjust your controller for spring schedule.
April	Do a thorough check of your irrigation system. Replace controller backup battery.
May	Adjust your controller for summer schedule.
June	Check emitters and sprinklers.
July	Check your controller settings after every power outage.
August	Check emitters and sprinklers.
September	Move emitters out to the dripline of all trees and shrubs as they grow.
October	Adjust your controller for fall schedule.
November	Do a thorough check of your irrigation system.
December	Adjust your controller for winter schedule.

Increase # of 50 yr HDPE pipes to specific spots(Colorado Flatirons Golf Course water and electricity use by up to 39%)

Challenges Ahead

- What do you still need to know or learn in order to do your project? What challenges are you still facing?
- How can your team, your peers, and your instructors help you face them?

Going Above & Beyond

AZ Renewable Energy Measures Partnership

- Home energy audits

City of Chandler's Recycling Coordinator, Traci Conaway

- Looking to other cities for guidance and programs



Questions?

