

This presentation premiered at WaterSmart Innovations

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COLLEGE OF
AGRICULTURE
& LIFE SCIENCES

WSI at WSI: Water Scene Investigators

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Arizona Project WET

- Supports teachers through professional development
- Educates students through real-life experiences
- Connects communities with K-12 schools and students

APW has trained 7,221 teachers and reached over a half million students in 263 communities.



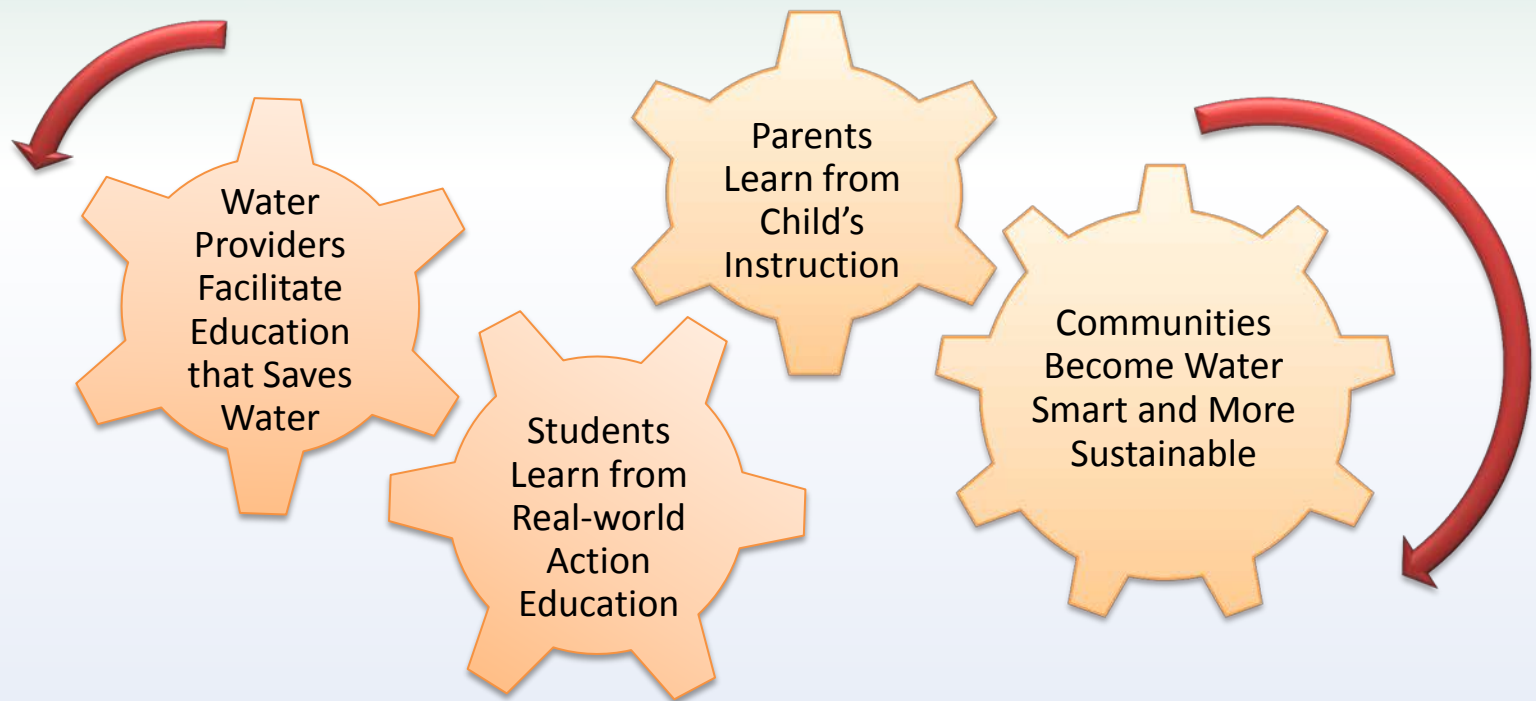
WSI Goals

- Develop a conservation education program that...

Delivers Results:

- behavior changes
- water efficient technology installation
- and real water savings!

WSI...makes the water conservation gears turn



How is this achieved?

Trained facilitators engage students in conducting a home faucet water audit and the students incentivize water efficient installations in their homes.



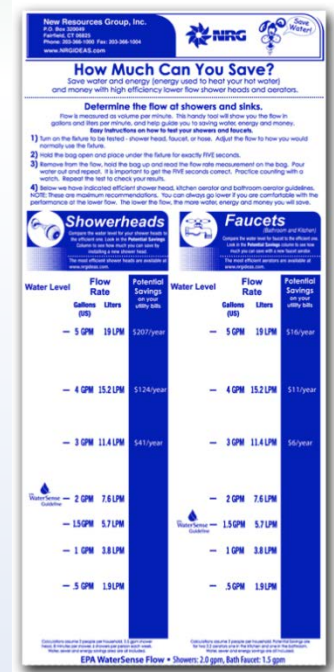
Preparing for the WSI

• Needs

1. Decide on audience(s): In-classroom v. nonformal settings
2. Trained staff and/or volunteers
3. Giveaway supplies (aerators & faucet flow measurement bags)
4. Suggested (but optional) examples of water saving technologies (water meter, water efficient shower head, dual flush retrofit for the toilet)

• Planning Timeline

1. Several months to develop partnerships & schedule
2. Several weeks – months to recruit & train
3. Time to assemble kits
4. Time to purchase audit items





Everything is in place, it's time to...

TRAIN YOUR WATER SCENE INVESTIGATORS

WSI Scheduling & Prep

- Scheduling Presentations
 - Two Day Format
 - Two days over a weekend
 - Offers 2 touch points – time to share and synthesize
 - Audit activity can be a gradable assignment for teachers
- Advance Preparations
 - Teacher sends home parent letter
 - Package flow rate bags & aerators per group sizes
 - Tracking system for distribution & collection
 - Water Savers' Mystery Box



WSI in the Classroom

1. Water Uses & Ways to Conserve

- *Focus questions: How do we use water? How do we conserve it?*
- Finding: Almost all brainstorming relate to behavior changes

2. Water Savers' Mystery Box

- *Focus question: How can we reduce water use or use water more efficiently at Home?*
- Students determine what the water efficient technology items are and how they are used to save water



The Faucet Audit Demo

1. *Focus question: How can we determine the flow rate of a classroom faucet?*
2. Process includes following a procedure, collecting data in a scientific way and recording data on a data sheet.



Faucet Audit Data Sheet

Table 2 Focus Question: How much water flows from the bathroom faucet when you turn it on? (in gallons per minute = gpm)												
<input checked="" type="checkbox"/> If Leaking <input type="checkbox"/>	Baseline Flow Rate (how you found the faucet, i.e. may or may not have an aerator)				Flow Rate Without Aerator				Flow Rate With New Aerator			
	1	2	3	Avg	1	2	3	Avg	1	2	3	Avg
<input type="checkbox"/>	2.6	2.3	2.4	2.43	4.0	3.8	3.7	3.83	0.9	1.1	1.1	1.03

What is the Average Baseline flow rate (gpm) = **2.43** What is the Average New Aerator flow rate (gpm) = **1.03**

Notes: (leak location, old aerator's condition, observations, etc.)

Table 3 Focus Question: Does the New Aerator result in water savings?					
Baseline Water Use			New Aerator Water Use		
Average Flow Rate (gpm)	Total Time min/day	Baseline Water Use per Day (Avg x total time = gal/day)	Average Flow Rate (gpm)	Total Time min/day	New Aerator Water Use per Day (Avg x total time = gal/day)
2.43	9.33	22.67	1.03	9.33	9.61

Change in daily water use due to aerator installation:

Baseline Water Use / day – New Aerator Water Use / day = **13.06** gal/day

What will you do to use *LESS* water each day? Mark one of the following:

- ☐ Re-install OLD aerator = 0 gallons / day water savings
☒ Keep new aerator = **13.06** gallons / day water savings
☐ Old Aerator has a lower flow rate
☐ My family chose not to keep the new aerator

Calculating Water Use per Year

Focus Question: What else do we need to know other than faucet flow rate to calculate water use per day or per year in gallons?

This requires critical thinking

The Water User Interview

1. *Focus questions: How much water is used by your family at home bathroom faucets each year? How much water can be saved each year by using aerators on all home bathroom faucets?*
2. Students learn to collect *observational & interview data* about water use practices of family members at home.
 - *Duration - How long water is run for each use.*
 - *Frequency - How many times each use happens per day.*






















With the goal of having all of the info necessary to calculate annual water use & savings!

Interview Data Sheet

Student Name: _____ Class Period: _____ Date: _____

Faucet Location: kid's bathroom

Table 1 Focus Question: For how many minutes per day does water flow from this faucet?

Water use	Water User #1: Ma			Water User #2: Sister			Water User #3:		
	# of Times per Day	Duration for Each Time (seconds)	Total Seconds per Day	# of Times per Day	Duration for Each Time (seconds)	Total Seconds per Day	# of Times per Day	Duration for Each Time (seconds)	Total Seconds per Day
Brushing teeth	2 	30 	60	2 	120 	240			
Washing Hands	5 	15 	75	4 	20 	80			
Other uses: Washing face	1 	60 	60	1 	45 	45			
Each User's Total Seconds Per Day			195			365			

Total seconds this faucet runs per day: User #1's total + User #2's total + User #3's total = 560 sec/day

For how many minutes per day does water flow from this faucet? Total seconds/60 = 9.33 min/day

WSI Day Two

1. Initial discussion of experiences
2. Finish data sheets & calculations
3. Complete Home Water Audit Report
4. Calculate the # aerators, water savings, # people in household & # interviewed – **here are you impact numbers!**
5. Conclude with Water Savings Comparisons
6. Introduce the EPA Pledge and assign for homework

Home Faucet Audit Report

Table 3 Focus Question: Does the New Aerator result in water savings?

Baseline Water Use			New Aerator Water Use		
Average Flow Rate (gpm)	Total Time min/day	Baseline Water Use per Day (Avg x total time = gal/day)	Average Flow Rate (gpm)	Total Time min/day	New Aerator Water Use per Day (Avg x total time = gal/day)
2.43	X 9.33	22.67	1.03	X 9.33	9.61

Change in daily water use due to aerator installation:

Baseline Water Use / day – New Aerator Water Use / day = 13.06 gal/day

What will you do to use **LESS** water each day? Mark one of the following:

☐ Re-install OLD aerator = 0 gallons/day savings **X** Keep new aerator = 13.06 gallons/day water savings

☐ Old aerator has a lower flow rate.

☐ My family chose not to keep the new aerator.

1. How many bathroom faucets did you audit?
2. How many water efficient aerators did you leave on your faucets?
3. How much water will your family save in gallons / day due to the installation of the new aerators? What about total water savings in gallons / year? 4,767 gallons/year
4. How many people live in your household? How many people were interviewed?
5. Did you encounter any problems when attempting this investigation? Please explain.
6. Did you discover anything new about how your family uses water and/or how to save water? Please explain.

Take the Pledge

- To wrap up the day, we encourage teachers & students to take the EPA “I’m for Water” Pledge



The image shows a screenshot of the EPA "I'm for Water" Pledge form. At the top left is a logo consisting of a blue water drop and a green leaf. To the right of the logo is the text "I'm for WaterSM". Below the logo and text are three input fields: "*Name:", "Email:", and "*ZIP code:". Each field is a white rectangle with a thin border. At the bottom of the form is a green button with the text "Take the Pledge!" in white.


- <http://www.epa.gov/watersense/pledge/>

Report Results Online

<http://cals.arizona.edu/arizonawet/water-savings>

Water Scene Investigations Data Submission

fs12.formsite.com/httpregwsazwet/form982302217/index.html



**School Water Audit Program
Water Scene Investigators**

Report Your Savings Here!

Congratulations Water Scene Investigators! You have made an important contribution to water conservation in Arizona. Please take the time now to report your water savings data. And, while you're here, please tell us the story of your Water Scene Investigations!

Complete the entire form and click the submit button below.

First Name

Last Name

Contact Information: School / Work Affiliation

School / Work Name

Street Address

Address Line 2

City

County

State Zip Code

School / Work Phone Number

School / Work Email Address

Tell us about your students.

Grade Level Number of Students

Total number of people in students' households

Tell us about your students.

Grade Level Number of Students

Total number of people in students' households

Share your results.

How much water will be saved **PER DAY** as a result of your participation in the Water Scene Investigations project? Please total the calculated savings from all of your students' homes.

Might you be interested in doing a full School Water Audit with your class(es) in the next 12-18 months? Yes ☐ No ☐

What is your "Water Scene Investigations" story? (Just a brief highlight and lowlight would be great!)

Do you have any other Student and/or Teacher feedback that you would like to share?

ARIZONA WET

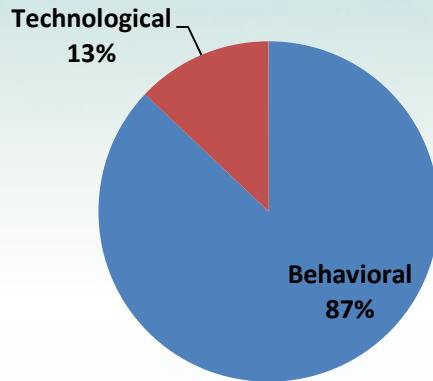
Contact:
Arizona Project WET
602-827-8200, ext. 813
email: AZWET-Maricopa@cals.arizona.edu

Indicates Response Required

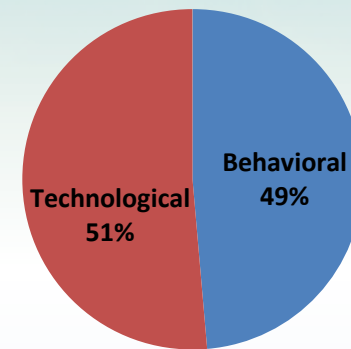
Submit

WSI Impacts

Pre-Test Answers



Post Test Answers



After the WSI, students were able to name nearly 3 more ways to conserve water. Results indicate that students had some prior knowledge of behavior methods, but almost no knowledge of technological methods.

WSI Impacts

The WSI has engaged **4,025 students in Arizona**, resulting in a projected water savings of **11.7 million gallons annually**.

Total Water Savings



WSI Costs

One class of 30 students

Staff time	\$360
Supplies, Printing, Mileage	\$56
Total	\$416

One school, 4, classes 120 students

Staff time	\$717
Supplies, Printing, Mileage	\$209
Total	\$926

Projected average savings from one classroom: ~50,000 gallons

Home Water Audit Projected Savings

917 aerator replacements	3.4 million gallons (annual customer savings)
Avondale	\$7,752
Chandler	\$5,032
Mesa	\$8,840
Scottsdale	\$6,120
Tucson	\$5,440

Based on water rates as of August 2012

WSI: Bringing it Home

- Students learn to measure baseline data, think critically and install simple retrofit devices. The result is that they teach their parents and siblings to conduct a home audit and replace aerators.
- Water providers and conservation organizations can target the now-aware families for next steps and incentive programs.



WSI and You

Adaptations to WSI so far:

- After School STEM and environmental clubs
- 4-H and Girl Scouts
- REI customers – Presentations

Want to work together?

- To create an online social networking and data sharing tool



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