



Sacramento County 4-H Youth Development Program

# 4-H Water Wizards Education Project

## Project Description

4-H Water Wizards is an 11-session project that teaches 4th-6th grade students about water and its importance to the planet. Developed by the University of California Cooperative Extension’s 4-H Youth Development Program and delivered in settings after school, the project is designed to encourage students to explore and discover about water as they become scientists themselves.

Students learn about the water cycle, watersheds, water usage, pollution, and water properties through building models, conducting experiments, and making observations. They construct a watershed; conduct a home water use survey; and explore salinity, density, taste, and hardness through experimentation. The project concludes with a student-planned service learning project that empowers youth to take action on a water issue they have identified in their community.

Students concluded their project with a field trip to the American River Education Center (ARWEC). One lucky site, Mary Tsukamoto Elementary, was rewarded with a day-long field trip to the Bay-Delta Model in Sausalito and a chance to visit the Pacific Ocean, the terminus of their watershed.

## Project Participation

Table 1 shows the number and grade level of elementary school students who participated in 4-H Water Wizards in the 2024-25 school year. 4-H trained eight afterschool program staff to deliver the project which served a total of 171 students at five elementary schools: Geniveve Didion, Oakridge and Tahoe in Sacramento City Unified School District (SCUSD); and Elliott Ranch and Mary Tsukamoto in Elk Grove Unified School District (EGUSD).



Students who participated in the 2024-25 4-H Water Wizards Project experienced an afternoon field trip to either the American River Water Education Center (ARWEC) in Folsom, or a day-long trip to the Bay-Delta Model in Sausalito. Above, students explore flooding using a model at ARWEC.

Grade	Elementary Students (n=171)
3 <sup>rd</sup>	15
4 <sup>th</sup>	47
5 <sup>th</sup>	51
6 <sup>th</sup>	51
Not Specified	7
<b>Total</b>	<b>171</b>

**Table 1:** Number of students in each grade level receiving 4-H Water Wizards in 2024-25.

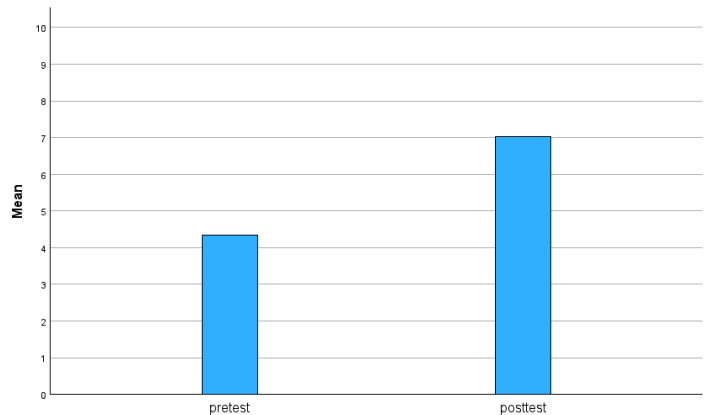
Ethnicity	Elementary Students (n=171)	Adult Program Staff (n=8)	Total	Percent
Caucasian	25	2	27	15%
African American	16	2	18	10%
Indigenous	5	0	5	3%
Asian	24	2	26	14%
Pacific Islander	6	0	6	4%
Hispanic	53	0	53	29%
More than one	28	2	30	17%
Not Reported	14	0	14	8%
<b>Total</b>	<b>171</b>	<b>8</b>	<b>179</b>	<b>100%</b>

**Table 2:** Demographics of students and staff participating in the 2024-25 4-H Water Wizards project.

## Project Outcomes

This year we did not conduct an evaluation to assess student learning; however we did conduct the assessment in the 2023-24 program year. The assessment included a student pre- and post-survey to measure their knowledge about material covered in the 4-H Water Wizards project, to assess their understanding about water issues in their community, and to learn if the project had made a difference in their water conservation practices. Three sites elected to take part in the evaluation, providing a total of 33 matched surveys. 4-H staff administered the pre- and post-surveys at the beginning and towards the end of the project. Students responded to nine survey questions pertaining to the water cycle, watersheds, salinity, water density, water issues, and conducting experiments. We tallied the total pre- and post-test scores for all sites and then compared them using a paired samples t-test. As Figure 1 shows, post-test scores were significantly higher ( $p=.000$ ). Overall, 79% of students improved their scores.

Students were asked to identify two water issues in their community. In the pretest 49% of the students named one issue in their community and 6% named two issues. In the post-test, 85% were able to name at least one issue and 49% were able to name two issues, suggesting an increase in knowledge in this area. As far as water usage (asked only on the post-test), 35% of participants said they were using less water as a result of participating in 4-H Water Wizards.



**Figure 1:** Pre- and post-survey scores for students participating in 4-H Water Wizards in program year 2023-24. Though data was not collected this year, data from multiple annual evaluation consistently demonstrated significantly higher post-test scores ( $p=.000$ ).



Students from Genevieve Didion learn more about groundwater at the American River Water Education Center.

These data are consistent with evaluations in previous years, and we anticipate that students receiving 4-H Water Wizards in 2024-25 would have similar outcomes in terms of increased knowledge and awareness about community water issues.

## Learnings and Insights

We always build on our experience as to how best deliver 4-H Water Wizards in afterschool settings. Below are highlights, learnings and challenges this past year.

Previously, we offered 4-H Water Wizards as a semester-long project. This year we decided to make the program a year long, beginning in October and ending in May. This gave more time for site staff to deliver the 11 sessions. It also allowed us to conduct two different meetings—morning and evening—for each of the training modules, giving staff greater choice for fitting training into their schedule. We had near perfect attendance at trainings.

We also found that staff were more engaged in training than in past years. They seemed to enjoy both the content and the company. Discussions were lively and excitement palpable when staff “discovered” their own learnings about water.

Field trips remain an important component of the project. We reinstated trips to the American River Water Education Center and are always grateful to provide a trip to the Bay-Delta model and Pacific Ocean. These trips are a celebratory way to help students gain a deeper, different perspective on what they have learned about water in the classroom. The trips continue to serve as an incentive for afterschool site staff to deliver the project. That said, we were disappointed not to be able to send more students to the Bay Delta Model. Typically, Mary Tsukamoto would be paired with another site for a fuller bus, but miscommunication with the partner site did not allow that to happen. The other site did visit ARWEC.

Sacramento County 4-H is positioned to serve more sites than we currently do. Sites from EGUSD and SCUSD that have participated in the past are often eager to return, but bringing new sites into the fold is challenging. This may be attributed to lack of awareness of the project and its demonstrated outcomes; the role afterschool staff play in the delivery of the project; finding staff who have interest and can attend training sessions; or simply lack of program staff at the site level. We believe site participation would increase should there be an opportunity to present the project to site directors over the summer. This would allow 4-H to promote the benefits of the project and site leaders to ask questions and prioritize participation.



Ranger Heather guided Mary Tsukamoto students through the Bay Delta Model. Protecting the watershed is an important theme.



Experiencing the beach, an environment that many students have not visited before, is always a trip highlight.



**Many thanks to our 2024-25 program partners:**

Erin Sipes, Elk Grove Unified School District  
Manpreet Kaur and David Truong, Sacramento City Unified School District  
Joan Roush, American River Education Center  
Ranger Heather Hill, US Army Corps of Engineers  
Jeanette Huddleston, Sacramento County Department of Water Resources



Images of 2025 4-H Water Wizards field trips including (clockwise) ARWEC flooding demonstration, Folsom Lake dam model; viewing the dam from Beals Point; Oakridge students; Bay Delta Model overlook; demonstration of how oil enters the bay.