WATER CHAMPIONS CASE STUDY

Wildwood High School

Business Partner: Key West Café

Wildwood High School participated in the Water Champions Program between 2018 and 2019. The engaged middle and high school students conducted audits at the high school and two local businesses to determine where water saving practices could best be implemented. Retrofits were conducted at the high school and one of the businesses, Key West Café. 23 water saving bathroom fixtures were replaced across the two participating locations. These retrofits are estimated to result in an *annual* reduction of 58,500 gallons of water used, $300 saved, and a greenhouse gas reduction of 0.15 MTCO2e across the two locations. Throughout the duration of the case study project period (2018-2023), this has amounted to a *total* estimate of nearly 300,000 gallons of water reduced, $1,500 saved, and a greenhouse gas reduction of 0.77 MTCO2e across the two participating sites. Additionally, as part of a home audit, a student was provided with a faucet aerator that reduced her personal home water usage by 77%.

Background

Wildwood High School in Wildwood, NJ, was the second school in the Cape May region to be recruited under the 2016-2023 Water Champions grant. The American Littoral Society (ALS) implemented the Water Champions program in 2018 and 2019 during an after-school program called Wave Twenty-One, which included both high school and middle school students. The students received 10 initial sessions of water conservation education presented by ALS in which they learned about Cape May's saltwater intrusion issues, responsible water management, and were trained to conduct water audits. Because the after-school program gave ALS more time with the students, they were able to expand the core educational presentations to include additional supplementary lessons. These included an activity from Project WET, which is a science-based education resource, as well as a video about global water issues, and a lesson about the psychology of conservation.

After receiving their water audit training, the students were tasked with researching technological and behavioral water usage habits in their homes, school, and local businesses before conducting audits at each of these locations. The goal of the audits was to identify old and wasteful fixtures such as faucets or toilets that could be replaced with high efficiency WaterSense or WaterSense equivalent models in order to conserve water across their community.

Case Study Highlights

- **Location**: Wildwood, NJ
- **Retrofitted Sites**: Wildwood High School and Key West Café
- **Case Study Project Period**: 2018-2023
- **Devices Replaced**: 14 devices (11 toilets and 3 sinks) across two locations
- **Project Period Water Savings:** An estimated 300,000 gallons across two locations
- **Project Period Cost Savings:** An estimated $1,500 across two locations
- **Project Period GHG Emission Reduction:** An estimated 0.77 $MTCO_2e$ across two locations
- **Home Audit:** A Wildwood student installed an aerator that reduced her part of her home water usage by 77%

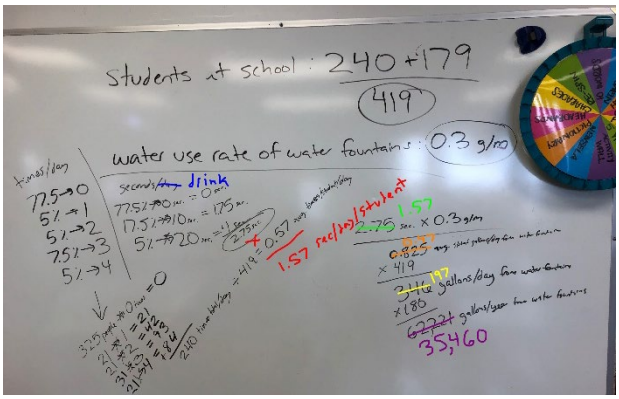
These products are certified to use at least 20 percent less water than regular models, which results in cost and energy savings once installed. By conserving water, these devices reduce the amount of energy used to pump, treat, deliver, and heat water, which reduces greenhouse gas (GHG) emissions. The reduced water use also results in a lower water and electric bill. Thus, the upgrades to fixtures identified through the audits save water, reduce costs, and indirectly save energy.

Home Audit

In order to complete the home audit, students were asked to gather information on the amount of water they use daily in their homes and calculate how much water could be saved with better practices and more efficient devices, such as aerators, installed. Given that Wildwood High School Water Champions was implemented through an after-school program, it was difficult to get the students to complete their home audits as homework. However, for one student that successfully conducted a home audit, there was a clear, actionable solution and clear result. After conducting an audit of her home water use, she determined that 55% of her personal use came from washing the dishes by hand. ALS provided her with a 0.5 GPM faucet aerator to replace her family's 2.2 GPM one. This instantly lowered that activity's water usage by 77%, creating a significant reduction in her home water use. This student's work was highlighted in the presentation the students gave to their school board.

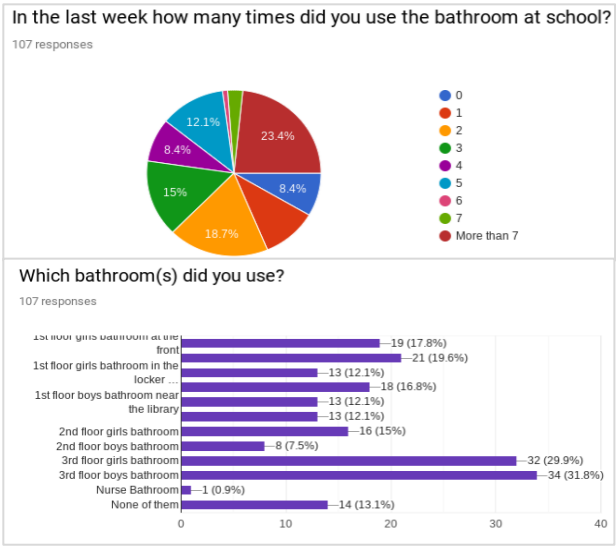
School Audit

The students were also tasked with completing audits of the school. They completed an in-depth school water audit by developing a survey that was completed by over 100 students, about a quarter of the school's population. The survey included questions requesting information on the frequency of bathroom use, how often and for how long students washed their hands and drank from water fountains, and which restrooms they used the most. Based on the results of the survey, the Water Champions students identified the devices in the school that were the most used and the least efficient and chose to use the grant funding to retrofit those with high efficiency models. For this reason, retrofits were scattered across the school rather than being focused on one restroom. The students presented the results of the survey, including their recommendations, to the school board.



Top: Wildwood students' calculation of the water use rate of the school's water fountains.

Bottom: Results from the school-wide survey of water use developed by the students.



Key West Café Business Audit

In addition to the school audit, the students conducted a business audit of Key West Café, a café located a few blocks from the school. The owner of the restaurant was enthusiastic about the project given the high utility rates in shore towns like Wildwood. The students first identified all of the water-using fixtures in the restaurant, which included several toilets, bathroom and kitchen sinks, and a sanitizer. The students calculated the rate of water use and how often the devices were used, which allowed them to estimate how much water the café used. They then calculated how much the business could save if they switched their fixtures to more water efficient ones.

The students estimated that the café could save about 230,000 gallons of water per year if they upgraded all their devices. Due to funding limitations through the grant, Key West Café ultimately only received money to replace the toilets and bathroom sinks, which would save them an estimated 49,000 gallons per year. However, they expressed interest in retrofitting the remaining devices if additional funding became available in the future.

Wildwood students conducting a business audit of Key West Café.

Installations & Measurable Results

After receiving Water Champions grant funding, eight new toilets were installed at Wildwood High School. The students calculated that these retrofits would result in around 9,400 gallons of water saved per year. Using the EPA's 2022 Pollution Prevention (P2) Cost and Greenhouse Gas Calculators, it is estimated that the water use reduction could save the school approximately $50 per year and reduce their greenhouse gas footprint by 0.025 metric tons of carbon dioxide equivalent (MTCO2e) annually. Since the installation of the devices in 2019, the school is estimated to have saved 46,800 gallons of water, $250, and has had a GHG reduction of 0.125 MTCO2e.

Key West Café received funding to replace six devices with water and energy saving models – three toilets and three sinks. The replacement of these devices is estimated to save around 49,000 gallons of water annually for the café, and using the P2 Calculators, could save the business approximately $250 a year and result in a greenhouse gas reduction of 0.13 MTCO2e annually. Since the installation of the device in 2019, the café is estimated to have saved 245,600 gallons of water, $1,300, and has had a GHG reduction of 0.645 MTCO2e.

In summary, it is estimated that throughout the duration of the Wildwood High School Water Champions grant project period, from the 2019 retrofit installations to the project period end in 2023, there has been a cumulative total of nearly 300,000 gallons of water reduced, $1,500 saved, and a GHG reduction of 0.77 MTCO2e across the two participating sites. These outcomes are the result of the hard work of the Wildwood High School Water Champions students and their community partners.

Acknowledgements

The New Jersey Department of Environmental Protection would like to thank the U.S. Environmental Protection Agency and the American Littoral Society for their partnership, as well as Wildwood High School and Key West Café for participating in the Water Champions Program.

Students receiving a Water Champions lesson during their after-school program.

NJ Department of Environmental Protection
Division of Water Supply & Geoscience

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