WATER CHAMPIONS CASE STUDY

Ocean City High School

Business Partners: Positively 4th Street Café & the Flanders Hotel

Ocean City High School participated in the Water Champions Program between 2017 and 2018. The engaged high school students conducted water audits at the high school, the local intermediate school, and four local businesses to determine where water saving practices could best be implemented. Retrofits were conducted at the intermediate school and two businesses: Positively 4th Street Café and the Flanders Hotel. 23 water saving bathroom fixtures were replaced across the three locations. These retrofits are estimated to result in an *annual* reduction of 250,000 gallons of water used, $1,300 saved, and a greenhouse gas reduction of 0.65 MTCO2e across the three locations. Throughout the duration of the case study project period (2017-2023), this has amounted to a *total* estimate of nearly 1.5 million gallons of water reduced, $7,600 saved, and a greenhouse gas reduction of 3.8 MTCO2e across the three participating sites.

Background

Ocean City High School in Ocean City, NJ was the first school in the Cape May region to be recruited under the 2016-2023 Water Champions grant. The program was implemented at the school between 2017 and 2018. Two groups of high school students participated over the course of two years, led by the school's AP Environmental Science teacher, Michael Pomatto. The students received 10 sessions of water conservation education presented by the American Littoral Society (ALS) in which they learned about Cape May's saltwater intrusion issues, responsible water management, and were trained to conduct water audits. 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. 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.

Case Study Highlights

- **Location**: Ocean City, NJ
- **Retrofitted Sites**: Ocean City Intermediate School, Positively 4th Street Café, and the Flanders Hotel
- **Case Study Project Period**: 2017-2023
- **Devices Replaced**: 23 devices (11 toilets and 12 urinals) across three locations
- **Project Period Water Savings:** An estimated 1.5 million gallons across three locations
- **Project Period Cost Savings:** An estimated $7,600 across three locations
- **Project Period GHG Emission Reduction:** An estimated 3.8 $MTCO_2e$ across three locations

Water Audits

After completing their home audits as homework, the students conducted school water audits with the help of ALS. Ocean City High School students conducted two school audits, one of the high school and another of the nearby middle school, Ocean City Intermediate School. Based on the findings of the audits, the students determined that the greatest savings would come from upgrading the two most-used restrooms at the intermediate school due to their older and less water-efficient fixtures. As such, Ocean City Intermediate school was chosen to receive grant money to install high efficiency, WaterSense devices in the identified restrooms.

Additionally, the students conducted four audits of local small businesses. Ultimately, due to business interest and funding availability, two of the four locations were chosen to receive funding for retrofits: Positively Fourth Street Café and the Flanders Hotel. The locations were also selected in part due to the preexisting relationship the students had with them; the café was a popular spot for students just down the street from the school, and the hotel was where their prom was typically held each year.

As part of the program, the students were also tasked with presenting the school audit results to their school board, the Ocean City Board of Education. During the presentation, they gave an overview of the Water Champions program and described their reasoning for why the Intermediate School should be prioritized. Due to a coinciding sports award event, the auditorium had a full house, which allowed the students to share their results with a larger audience than anticipated. It presented them with an opportunity to give an impromptu lesson on water conservation to many district residents and expand the reach of the Water Champions program in the area. The students also took a field trip to New York City to tour the EPA building and present their audit data directly to the EPA.

OCHS Water Champions students taking an inventory of the water using fixtures at the intermediate school.

Participating students presenting their findings to the Ocean City Board of Education.

Installations & Measurable Results

After receiving Water Champions grant funding, 18 new devices were installed in the two restrooms at Ocean City Intermediate School – eight toilets and ten urinals. The students calculated that these retrofits would result in around 218,900 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 $1,130 per year and reduce their greenhouse gas footprint by 0.57 metric tons of carbon dioxide equivalent (MTCO2e) annually. Since the installation of the devices in 2018, the school is estimated to have saved 1.3 million gallons of water, $6,800, and has had a GHG reduction of 3.4 MTCO2e.

In order to better understand the true water savings achieved by the program, Ocean City Intermediate School water bills were collected from before and after the retrofits were installed. Comparing submitted water bills from 2017 and 2022, the DEP found that there was an estimated 570,000 annual gallon reduction, which surpasses the students' annual estimate of 218,900 gallons. However, this calculation is based on limited data that does not fully account for confounding variables such as seasonal or multi-year variability and may include data from additional locations or water meters that are beyond the scope of the project. Therefore, these values should still be considered estimates. The collection of additional water usage data would result in a more accurate and robust measure of the program's impact on water savings.

Positively Fourth Street Café installed one new device, a water efficient toilet. The new toilet is estimated to save 1,950 gallons of water a year, and using the P2 Calculators, could save the business approximately $10 and result in a greenhouse gas reduction of 0.005 MTCO2e annually. Since the installation of the device in 2018, the café has saved an estimated 11,700 gallons of water, $60, and has had a GHG reduction of 0.03 MTCO2e.

The Flanders Hotels installed two new toilets and two new urinals, which are estimated to save 28,600 gallons of water annually. Using the P2 Calculators, this could save the business approximately $150 a year and result in an annual greenhouse gas reduction of 0.075 MTCO2e. Since the installation of the devices in 2019, the hotel has saved an estimated 143,000 gallons of water, $740, and has had a GHG reduction of 0.375 MTCO2e.

In summary, it is estimated that throughout the duration of the Ocean City High School Water Champions grant project period, from the 2018 retrofit installations to the project period end in 2023, there has been a cumulative total of around 1.5 million gallons of water reduced, $7,600 saved, and a GHG reduction of 3.8 MTCO2e across the participating sites. These impressive outcomes are the result of the hard work of the Ocean City High School Water Champions students and their community partners.

Ocean City Intermediate School restroom with newly installed high efficiency WaterSense certified toilets, urinals, and faucet aerators.

"[Water Champions] allowed me to better understand local water usage and work with professions from the DEP, EPA, and Littoral Society, while having the opportunity to explore and improve local businesses' water usage."
- Melissa Kampf, OCHS Student

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