

Fish Hatchery Becomes Baseline for Water-related Careers

By Shyanne Carroll



Career and technical education (CTE) graduates are working across the nation in water-related fields, but how many students can say they chose their career because of the experience of operating a wastewater treatment plant by way of a fish hatchery while in high school? The answer is likely not many, unless they are graduates of Buckeye Career Center (BCC) in New Philadelphia, Ohio, where Natural-Resources students maintain five outdoor ponds, 13 indoor tanks and 200,000 fish each year.

Spawning the Future

Aquaculture has been a major part of the program's curriculum with John Oliver as the Natural Resources instructor at BCC for the past 16 years. He says the tilapia operation began inside the lab while the class trying to assist a local aquaculturist. "He had 42 tilapia and didn't have his building ready to house them. He said if we could get them to spawn, we could keep those and he only wanted back his original fish," Oliver explained. The students raised 10,000 fish inside the lab, and the following year, the operation was moved to the greenhouse on campus, where the fish hatchery remains today.

The production expanded when school officials decided to build outdoor ponds to house some of the fish. According to Oliver, students were involved from the very beginning: "They did the preliminary surveying to determine the exact pond locations. They had to identify plants and environmental impacts and even operated the heavy equipment to dig the ponds." The construction also required watershed management, and students were tasked with building limestone treatment basins to remediate the acid water in the area due to prior mining.

Fish Tales

To introduce new students to the fish project, Oliver teaches them to catch and sort existing fish in the outdoor ponds, which contain five types of tilapia, along with bass, goldfish, bluegill, koi and specimen fish. This helps students learn the ropes of pond management and introduces them to customers who are interested in purchasing these fish. He then splits his new students into groups of two or three. Each group is required to maintain a large indoor tank and its attached filtration and treatment plant, which includes a clarifier and biofilter. Students learn terminology, feeding and reproduction during the first few weeks of school. Seniors are learning more complex issues with pond and tank management,



including integrated pest management. Students can be seen in the fall stringing lines across each pond to prevent native birds from eating the fish.

“It all fits together. We do pest management with our pheasant pen and bird boxes. This is just a piece of the puzzle, but pond management gets the most attention,” said Oliver. He also uses scientific methods to help his seniors learn about fish reproduction and genetics as they hypothesize possible genetic combinations and use the Punnett square method to breed customer-requested fish. “I can take many of the things they are learning in biology and chemistry and use the fish project to teach it,” he added.

Sink the Line

During their time in BCC’s Natural Resources program, students are also specializing in wastewater treatment plant operations and the science involved in maintaining such a complex system. According to Oliver, the fish hatchery has



three basic processes: physical, biological and chemical.

The physical process involves physical separation of the solids, or fish waste, using a clarifier, which is similar to a tank filter. The solids fall to the bottom of the tank and are removed and treated. The second process is biological, which involves the liquid or influent being separated into a second tank with media or biologics that treat the ammonia. This recirculates the water back into the system. The final process is chemical or salt treatment. Oliver explains that this removes the chlorine from the water so the water can be recycled to grow plants and fish. Students are currently growing lettuce, duckweed and frogbit.

When using any of these three treatment processes, students are required to test water quality using an electronic tester and chemical test kits, just like they would at a wastewater treatment plant.

Oliver says the idea of raising fish encourages students to branch out into the Natural Resources program.

The fish project also serves as a catalyst for teaching aquaculture, small animal care, animal reproduction and health, genetics, and business. “This project has real-life consequences. They are responsible for what happens to their fish. If someone doesn’t do something right, it shows up in the fish project, and fish die,” Oliver said. “This is as close as I can get to teaching responsibility. It’s their product, and they have to make sure it’s taken care of and treated humanely.”

Schooling the Community

The fish project is able to continue raising 200,000 fish annually by selling about half the stock to customers across the United States. The business side of the operation is primarily handled by the

senior class, which elects class officers to process customer orders.

In addition to turning a profit, the fish hatchery also serves as a learning experience for community members.

“This is not something that is just for the high school students,” Oliver said. “We are far enough ahead of the curve on this; last year, I had four businesses [send representatives] in to learn how to set up their own systems.”

This school year, 18-year-old Giovanni Spinelli serves as the Natural Resources senior class president and is responsible for customer relations. He says pickup day is extremely important for future sales, while also serving as a culmination of a job well done. “We load their fish right in front of them, so you have to be professional and humane with the fish,” Spinelli said. “It’s rewarding knowing that somebody else wants your fish, and the fish are going to make them happy in some way.”

Spinelli plans to further his education at Ohio State University at ATI to pursue a degree in Bioenergy and Water Treatment Management. He says his experiences with the ponds and fish hatchery helped him make that decision, but his other Natural Resources experiences will continue to play into his future. “People don’t realize how the environment and ecosystems work hand-in-hand with everything in the natural-resources field. You might have a job in forestry, but you are going to deal with water quality,” he said. “In tree service, you have to be careful to not contaminate the water. It is all connected in some way, and eventually you are going to use everything you have learned,” said Spinelli.

Review the Sample

Karen (Morrison) Fuhrer, a 2015 alumna, completed high school and immediately secured a position at a local, well-known engineering firm. Within six months, Fuhrer was heading the water-sampling

department, visiting oil and gas well-pad sites to conduct water sampling and testing. Fuhrer also does wetland delineation, wetland assessments, wetland restoration and even some forestry identification, all things that she learned during her time in the Natural Resources program.

“When they hired me, they didn’t know that I knew all this stuff. It’s really amazing for me because I don’t have a degree and I came straight out of high school already knowing these things,” said Fuhrer. Fuhrer graduated high school with OSHA 10 and Safeland certifications and achieved additional certifications in college, but credits BCC for preparing her for the workforce. “The Safeland certification is key. I’m not even allowed on a well-pad site without it, and I achieved that my senior year,” she said.

Fuhrer admits she wanted to be an environmental biologist one day and never really wanted to work specifically with water, despite the extensive knowledge that she gained from maintaining the Natural Resources fish hatchery. Looking back, she is extremely thankful that she already knew about dissolved oxygen, turbidity and pH sampling — three things she uses almost daily when sampling groundwater for landowners.

“One of the things we test for is chloride. If chlorides are present, that generally indicates a spill. It’s not unlikely for me to be called to an emergency spill at a well pad where I need to sample the groundwater to determine the exact spill location,” she added. Water sampling was something she did daily in the BCC fish hatchery. “We sample water pre- and post-installation of well pads, which is an Ohio Department of Natural Resources requirement before construction begins. We also sample all of the developed water sources — wells, springs and ponds — for total chloroforms, bacteria, chlorine and more. We learned about petroleum byproducts,



and here I am, working with them on a regular basis,” Fuhrer said.

Participating in FFA contests have also been beneficial to Fuhrer’s professional life, using her macro-invertebrate knowledge of salamanders and leeches to help other local pond owners. “If you see leeches in water, it is a good indicator that the pond is in bad shape,” she said. “If I see salamanders, I know it is really good water. We had to study good pond life and pond management; that’s huge in what I do,” she added. “If I go to a landowner’s pond and it is full of algae, I can suggest a remedy, such as adding tilapia like BCC raises.”

Just Keep Swimming ... to Alaska

Jeremy Hadden, a 2004 graduate, attributes his exposure to fish while attending BCC to his current career and life in Alaska. The small-town Ohioan was attending Hocking College in Nelsonville, Ohio, when he decided to take a





leap of faith and travel to Alaska to work in the fish industry as a seasonal technician during his summer breaks. He hasn't looked back. "I thought I'd work there in the summertime. After I graduated, I kept coming back and I eventually decided to stay, and I haven't left the state since," said Hadden. He is currently a fish culturist at Valdez Fisheries Development Association Inc. in Valdez, Alaska. In 2018, the company claimed the title of the largest pink salmon hatchery in North America, producing 270 million pink salmon that year alone. "We take 270 million pink salmon eggs and 2 million coho salmon eggs and raise and release them," said Hadden.

Hadden's love of fish began at Buckeye with tilapia, before the current indoor fish hatchery was even created. "I think one of my driving factors was just the exposure to the possibilities in that career field. I don't think I would have gone that direction had I not been at Buckeye. I had no idea these jobs existed."

He believes the multidisciplinary approach of the program has also helped him succeed as an adult and make a life in Alaska. "My skill set varies between basic carpentry, manufacturing and more. Part of the year, I spend my time in a loader moving snow, so it's not all directly related to fish. Producing fish is the goal, but I'm not always handling fish," said Hadden.

A Professional Perspective

CTE educators are constantly trying to ensure the information students are learning is relevant to industry standards. New Philadelphia, Ohio, water plant superintendent Scott DeVault believes the BCC Natural Resources program is keeping up with the times. He encourages training opportunities for those who want to get into the water/wastewater industry that would allow prospective employees the chance to gain needed certifications. "There are exams and courses and a lot of self-study because not a lot of places provide the training," he said.

According to DeVault, applicants need more than high school training to satisfy the requirements of agencies like the Ohio Environmental Protection Agency, but he says students should at least be prepared to learn and follow guidelines.

"Understand what the plants do. Understand there are certifications and education to hold those positions. We have EPA rules we have to follow and that's a big step for a lot of students. It becomes an educational process," said DeVault.

Go Fish

As educators, we know that careers are everywhere — our students have to discover their own passions, and we can help them prepare for their futures. It's part of the mission statement at Buckeye Career Center, but we think every school has the opportunity to do this and even every lab program.

Careers in water can probably be found in every industry, but at BCC, Natural Resources is the first one that comes to mind.

Whether it's raising fish in Alaska, testing groundwater samples, cutting timber or working in a water or wastewater plant, we must encourage our students to use this resource and the lessons learned through our fish hatchery to better their lives and the lives of others. ■

Shyanne Carroll is the public relations coordinator at Buckeye Career Center in New Philadelphia, Ohio. She previously worked as a news reporter/anchor at a local radio station. She enjoys telling the students' perspectives of every story that comes out of the career center. Buckeye serves 12 school districts within three counties. Email her at scarroll@buckeyecareercenter.org.



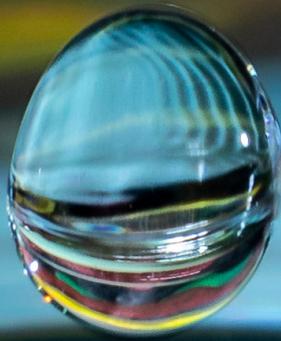


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