The 'Other' STEM: the Overlooked Role of Outdoor-Based Learning in Preparing for Green Jobs

April 19, 2022 - Heidi Smith

Although the acronym 'STEM' includes four disciplines - Science, Technology, Engineering and Math - the common perception of the term has come to focus on just one: technology. STEM programs, especially those aimed at K-12 students, often revolve around computer programming, robotics or other indoor activities.

But another world exists: outdoor-based STEM, the heart of multiple industries including fisheries biology, forest management, conservation and agriculture. PEI collaborates with community partners to introduce more students to the opportunities these industries provide, especially for those who love science and engineering and prefer to be outside.

There are few things that are this rewarding," says Leslie Druffel, Outreach Coordinator for The McGregor Company. "Every day you're outdoors. The weather can be a challenge sometimes, but working in food production, you're obviously an optimist because you're planting a seed or helping someone plant a seed." The McGregor Company serves growers in Washington, Idaho and Oregon with research, seeds, equipment, crop inputs and advice needed to raise healthy, sustainable crops.

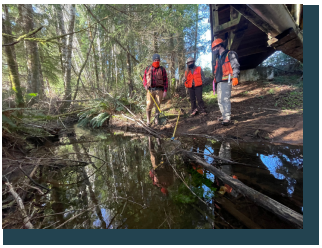
McGregor's crop advisors use STEM daily to make recommendations to growers based on what was planted the previous year, what product was used, what kind of weed or crop infection they're dealing with, and whether they're rotating crops. "It's like a doctor and a nutritionist making sure you are always healthy and well fed," Druffel explains. "There are a lot of factors that go into making recommendations for what a particular crop in a particular field is going to need to grow."

The staff also uses technology extensively, but Druffel emphasizes that all the machines need to be programmed by humans with the expertise to make them effective. Service technicians calculate the amount of fertilizer the field equipment should apply. Air seeders are large tanks with soil-slicing mechanisms that can be adjusted depending on the size of the seed being planted. "You have to make sure it's the right size for the seed and also understand what population you want per acre," says Druffel. "All of that magical technology has to be figured out ahead of time by an agronomist working with the grower."

Forestry is another industry that applies STEM outdoors. Andy Perleberg is the Regional Extension Specialist and Forestry Team Leader for Washington State University Extension in eastern Washington. A major part of his role involves advising private landowners on how to manage their forests. "Foresters need to be able to measure a tree and determine its condition and volume," he says. "How many of those trees are there and what are we going to tell the owner about how much they are worth? We're bringing in geometry and all sorts of engineering skills."

Some of the most common ways foresters apply STEM are through surveying, measuring and helping landowners remove and replace stream crossing structures that keep trout, salmon and other fish from reaching upstream habitat. Perleberg says the industry is experiencing a shortage of trained workers. "The people I work with are primarily small

forest landowners," he explains. "We need to be able to give them advice, and we don't have enough people coming out of college programs that can give them site-specific advice because they don't have the skills to collect that data."



Education is key, he believes, especially before kids reach college age. Each year, Perleberg takes self-selected junior and senior students from Cashmere High School's natural resources class on a trip. They observe different types of habitats such as north and south aspects, overstocked tree stands and streams. "The kids just want to learn," he says. "Some of them have gotten jobs as summer firefighters or surveyors. They come out with me to get the hands-on experience. Everything builds on the skills they've already learned."

In summer 2022, Perleberg will be part of a PEI event he's helping to develop for 20 educators which will include a site visit to a working forest and a mill. "They're going to get a concentrated immersion in forestry and then they're expected to develop questions and ideas of what they can do in their class, based on what they're learning," he says.

Druffel also sees education as a critical factor in attracting more students to jobs in agriculture, another industry facing workforce shortages. As of 2021, farmers and ranchers made up just 1.3% of the U.S. labor force. "What PEI is doing is absolutely critical," she says. "Because we have so few people directly involved in food production, there is a loss of knowledge of just how it all works. It's not for every fourth grader to say, 'I want to be a farmer.' But we would like them to say, 'There are a lot of opportunities for me to apply this kind of math and science in agriculture.'"