For Emmely Briley, a high school chemistry and physics teacher, working in the rural logging community of Molalla, Ore., for the past 13 years has at times felt isolating.

While students 30 miles north in Portland had access to STEM fairs and camps, Ms. Briley's students have historically had few such programs for science, technology, engineering, and mathematics closer to home. Although Ms. Briley would have liked to make her classes more authentic—by bringing in scientists as guest speakers or having her students conduct experiments in the community, for instance—she wasn't sure how to go about forging the connections to do so.

"I've felt cut off from some opportunities," she said. "I always wanted somebody I could call up at Xerox and say, 'Hey, we want to take a tour,' but I didn't know how or who to call."

Now, Ms. Briley says, that's changing. The 2,400-student Molalla River school system, where she works, is one of many districts across the state involved in a regional STEM hub—essentially a coalition of K-12 schools, universities, businesses, and community organizations, such as nonprofits and museums, that work together to improve education in the STEM fields.

These sorts of coalitions are popping up in many places around the nation—from Oregon and Washington State to Michigan, New York, and Ohio—as a way to catalyze and better connect STEM education efforts in local communities.

Last month, the Oregon Education Investment Board, chaired by Democratic Gov. John Kitzhaber, awarded $2.8 million in grants to six regional hubs across the state.

"The idea behind the regional STEM hubs is we need to connect these isolated pockets of excellence across the state," said Mark Lewis, the STEM director for the board. "We've got to create a more dynamic culture of exchange."

Across the country, establishing such hubs has become a common strategy of statewide STEM education networks and councils that are looking to advance student engagement in science, technology, engineering, and math.

Excited and Engaged

The South Metro-Salem STEM Partnership is made up of 15 Oregon school districts, including Molalla, serving a total of 120,000 students. Six postsecondary institutions and 20 businesses and community organizations are also involved.

The backbone organization for the hub, which received $600,000 in the OEIB grant process, is the Oregon Institute of Technology, based in Klamath Falls. Lita Colligan, an associate vice president at the university and the co-chair of the Salem hub, said she began focusing on forming partnerships in 2012 when Oregon Tech opened a satellite campus in Wilsonville and was looking to build a pipeline of students.
"We didn't feel like we were connecting enough with schools and teachers and kids," she said. "We convened a group of partners and community organizations and said, 'What do we need to do to help get more kids excited about and engaged in and going into science?'"

The Salem STEM hub now has three initiatives: providing professional development for teachers, connecting organizations and schools through an online network, and bringing more college-level courses to high schools. Ms. Colligan said that while she's been working on the partnerships for nearly two years, the formal hub is still in the early stages, working on "figuring out how to go across silos."

For their part, industry partners are interested in getting involved both to engage their employees and help develop the STEM workforce, said Craig Hudson, the co-chairman of the Salem hub and an engineering team leader at the satellite-navigation company Garmin, which has an office in Salem.

"Every business is thinking about how to grow and how to manage what talent pool we draw from," he said. "It makes more sense to educate kids that are local. We get some nice diversity when we bring kids in from out of state, but if they don't have a strong family connection here, they're not likely to stay here for the long term."

Mr. Hudson said he is hopeful that the online network will help businesses connect with classrooms in a way that's more meaningful than, for instance, simply dropping by a school for a career fair.

"Ideally, we'd like to be able to partner with them to build something tied to the curriculum, so a relevant speaker can come in and say, 'This is what I do,' and show there are jobs connected back to that particular strand in the Common Core [State Standards]," which Oregon and the majority of other states have adopted.

The hub's success will be gauged by a variety of measures, Ms. Colligan said, including changes in scores on standardized tests, the number of hours of math and science instruction in schools, how many students participate in voluntary STEM activities, and the number of college-credit courses available to K-12 students. However, she emphasized, the returns won't come quickly.

"To see real educational change, I think you're talking like 10 years," she said.

Portland Partnership

The Salem hub is taking a horizontal approach, said Ms. Colligan, trying to reach as many teachers and schools as possible for STEM training.

Meanwhile, the Portland Metro STEM Partnership, another grant recipient and the oldest of the groups, having begun about four years ago, is conducting both broad outreach and some deeper work focused on individual schools.

Led by William Becker, the director of the Center for Science Education at Portland State University, the Beaverton, Ore.-based hub includes four school districts serving 116,000 students and 40 community partners, such as Vernier, Intel, and the Oregon Zoo. In addition to facilitating professional development and industry connections, the group is working with seven STEM "transformation" schools "to do essentially a makeover" using an improvement model based on research by the Carnegie Foundation for the Advancement of Teaching, said Mr. Becker.
The transformation schools "want to build their programs and help the student body establish an image of being successful at STEM," Mr. Becker explained. "We've taken a look at various models the school might adopt, and had the very hard conversations with the faculty and principal about where they want to make investments. They've developed and created, with our help, a STEM investment plan--a road map for how they see themselves moving forward."

"They've been real thought leaders out there," said Mr. Lewis of the OEIB about the Portland hub. "Their model is an implementation program model, not as much high-level policy coordination."

Yet even under the nascent and more horizontal Salem model, classroom teachers are starting to feel the hub's effects. In fact, experienced science teachers are the ones organizing and leading the professional development sessions.

"This is all grassroots-driven," said Ms. Colligan of Oregon Tech.

And for Ms. Briley of Molalla, who serves on STEM work groups and has been integral to the hub's development, being involved with the coalition has helped her make those previously missing connections.

"I now know people all over the place--engineers and college vice presidents--and they're all very passionate about something I've been passionate about," she said. "It's exploded the amount of information and connections available for our school district."

In fact, prior to getting involved in the hub, Ms. Briley did not even know Oregon Tech's newest small campus in Wilsonville existed. "Thirty-five minutes away, there were all these opportunities and yet our little district out here in rural isolation had no idea," she said.

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