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COMMENTARY

Hidden in Plain Sight: Making Maine's Science Leadership Visible

by Kate Dickerson

Leadership in science calls for a culture that supports science. But what happens when the population at large doesn't know what is happening in the world of science? Science may be hidden from view especially when it takes place at educational institutions, nonprofit research laboratories, or businesses whose primary job is to do science, not market it. This concern is particularly relevant in Maine, where there are national and international leaders in their fields, but rarely public recognition of their work. How does Maine create a culture that pays attention to science and in which Maine's students can see a future for themselves in these fields?

The lack of understanding about science opportunities in Maine has implications for both the present and the future. Policies we enact today may undercut the work of science leaders by not recognizing the impact of their research. For the future, young Mainers may not see the value of an education rooted in science, technology, engineering, or mathematics (STEM). And Maine may not be able to fill the growing number of STEM jobs. How do we correct this problem?

For science leadership in Maine to grow, we need to highlight and support the science leaders we currently have. We need to expand the pool for the next generation of scientists and increase appreciation for the value of science, technology, and innovation in our state. What I report here is an innovative strategy that shows great promise as a way to highlight Maine's science leadership, to educate Mainers of all ages about Maine's remarkable developments

in science leadership, and to inspire both current and future generations of Maine's science leaders by providing a space where they can talk about their work with the public.

The approach: a festival where attendees of all ages explore and celebrate the science happening in Maine. Modeled on art or film festivals, the Maine Science Festival (MSF) provides the opportunity to hear from leading scientists, engineers, and innovators who work in Maine. These leaders talk about their work in an array of formats, including presentations, forums, workshops, films, exhibits, and hands-on activities, which fosters conversations with festivalgoers of all ages.

WHY SHOWCASE MAINE'S SCIENCE LEADERS

While Maine has a higher percentage of high school graduates than the US average, the state has a lower percentage of citizens who graduate with either a four- or two-year degree than the US average. Although Maine is slightly ahead of the US average in STEM degrees/certificates awarded, most experts consider the numbers too low to meet future needs (ECS 2018). At the Maine Engineering Workforce Summit (September 29, 2016 in Augusta), Dana Connors of the Maine Chamber of Commerce noted there are four times as many job postings for engineers as there are students graduating with an engineering degree in Maine.

A further barrier may keep Maine students from studying STEM fields: lack of awareness of the variety of

science-based companies and organizations in Maine and the work that they do. For example, most Mainers are aware of the Jackson Laboratory (JAX), and think, "They are the mice producers." While true, that barely scratches the surface of the cutting-edge research at JAX, whose researchers are studying the pathways, background, and potential methods for curing everything from addiction to Alzheimer's disease to cancer. The Jackson Laboratory ranks among world leaders in genetics research, and its impact goes far beyond producing mice.

Educational and research institutions such as the University of Maine, University of New England, Husson University, Bigelow Laboratory for Ocean Sciences, MDI Biological Laboratory, Schoodic Institute, and Gulf of Maine Research Institute play important roles in using science to understand the world. Maine science leaders also come from the many businesses that rely on STEM fields, including Idexx, GE Power, Eagre Games, Kennebec River Biosciences, Emera Maine, Baker Company, FMI, FMC, Corning, Inc., Redzone Wireless, Woodard & Curran, Cerahelix, Old Town Canoe, Pratt & Whitney, Backyard Farms, Alba-Technic, and Ocean's Balance (to name just a few such companies that have been a part of the MSF). There are Maine companies, large and small, that rely on Mainers' knowledge and understanding of science, engineering, and innovation.

The importance of science-based leaders in Maine goes beyond understanding how the world works. Maine's scientists and science-based businesses

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also serve as an economic driver for the state. Recent developments in the areas of aquaculture (Cole, Langston, and Davis 2017), cross-laminated timber and start-up successes,¹ combined with the continuing growth of established companies² heighten the connection between strong science and engineering, as well as new industries and pathways for Maine.

MORE VISIBILITY FOR MAINE SCIENCE

One way to highlight the science leadership we do have—for both students and the public—is to increase access to scientific knowledge outside formal school settings (Change the Equation 2012). The Maine Science Festival was designed to provide just such a program. The MSF weekend, launched in 2015, celebrates and explores Maine science, engineering, technology, and innovation. The festival spans four days over the third weekend of March (increasing to five days of events in 2019) and is held in Bangor.

At the MSF, we've created a new way to get the public interested in and excited about science, using events that are different from what people expect—talks in bars, workshops with artists and scientists working together, exhibits, and hands-on activities for all ages. To make Maine science, research, and innovation accessible to all Mainers regardless of income, festival events (other than the headliner) are available without charge. MSF events provide festival attendees the opportunity to learn from researchers and practitioners about what they do in their labs or as part of their businesses. We also have begun having MSF pop-up events—talks, presentations, film screenings—in different locations around the state throughout the rest of the year. This allows us to maintain the focus on

Maine science leaders and to encourage people to join us at the full MSF.

The MSF has an established network of Maine-based partners representing many different scientific fields (<https://www.mainesciencefestival.org/partners/>). These partners include the organizations and people who make up Maine's science leadership. With this approach, and our partnerships with arts organizations that have mastered the art of storytelling, the MSF connects scientific leaders with the public, so they can talk about Maine science.

CULTURE OF SCIENCE

Over the past four years, the MSF has become an important event for Maine science, a place where practitioners and supporters meet up, plan, celebrate, and explore new options for research, partnerships, and recruitment. Just as important, the public has begun to recognize the value and importance of Maine's scientists, innovators, and scientific enterprises. The MSF is especially important for festivalgoers from rural areas who are not as likely to have access to science-themed events.

The MSF highlights leaders in their fields, from up-and-coming to well-established researchers who are known worldwide. The festival provides an opportunity for Maine science leaders to meet with Maine leaders from other areas—policymakers, business leaders, and educators. For example, at a 2016 MSF event (5 Minute Genius), a scientist explained the work her company is doing to create a filtration system for immensely dirty water (think fracking). Someone in the audience was inspired by the talk and became an investor in that company. Many collaborations have been created or fostered at the MSF, and these connections are paying

dividends for Maine's place in the world and our basic understanding of the world around us.

We recognize that not every student in Maine will (or even should) end up being scientists or engineers. We also know that not every Mainer who has completed their formal education works in a science-based field. However, understanding the basics of science and engineering is vital to understanding how Maine can (and is) moving forward. Ultimately, the MSF provides a forum for Maine's scientific leaders—both people and organizations—to share their knowledge, expertise, and excitement with all of us. The MSF provides Mainers the opportunity to learn from, and be inspired by, the people who are the best in their fields. 🐟

ENDNOTES

- 1 Several articles published in *Mainebiz* in 2018 highlight these successes: "Maine Company Unveils \$250M Plan to Create Land-based Salmon Farm in Bucksport," ([http://www.mainebiz.biz/article/20180223/NEWS01/180229962/maine-company-unveils-\\$250m-plan-to-create-land-based-salmon-farm-in-bucksport](http://www.mainebiz.biz/article/20180223/NEWS01/180229962/maine-company-unveils-$250m-plan-to-create-land-based-salmon-farm-in-bucksport)); "Cerahelix Secures \$2 Million in Venture Capital Funding" ([http://www.mainebiz.biz/article/20180315/NEWS01/180319966/cerahelix-secures-\\$2-million-in-venture-capital-funding](http://www.mainebiz.biz/article/20180315/NEWS01/180319966/cerahelix-secures-$2-million-in-venture-capital-funding)); "SmartLam Becomes Second CLT Company to Locate in Maine." (<http://www.mainebiz.biz/article/20180216/NEWS01/180219957/smartlam-becomes-second-clt-company-to-locate-in-maine>).
- 2 For more about the success of some established Maine companies, see Anderson (2018), and the following press releases: <http://www.forestsformainefuture.org/fresh-from-the-woods-journal/sappi-westbrook-papermaking-on-the-fashion-frontier.html>; <https://www.idexx.com/en/about-idexx/news/idexx-laboratories-join-sp-500-index/>

C O M M E N T A R Y

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Kate Dickerson is the founder and director of the Maine Science Festival. Prior to heading up the MSF, she worked in the energy and envi-

ronmental field for more than 20 years, with positions in Rhode Island, Seattle, Washington, and most recently focusing on policy work. Kate is inspired daily by the work of Maine's scientists, engineers, technologists, innovators, researchers, and students.

COMMENTS FROM MSF ATTENDEES

Presenters

- **Jennifer Page, Hurricane Island:** Individuals who may not have formerly seen themselves as interested in science walk away from MSF inspired to pursue new passions, ask new questions, and communicate the value of science as practitioners themselves.
- **Tom Bickford, Maine Robotics:** The MSF is doing a great job of promoting science and giving us the opportunity to spend time with hundreds of visiting members of the public.
- **Sharon Klein, University of Maine:** Speaking at 5-minute Genius was a great experience—it pushed me to speak intelligibly, concisely, and quickly about my research to an audience with varied scientific backgrounds.
- **Anne Lichtenwalner, University of Maine:** The MSF is also a two-way street; people often have intriguing narratives about wildlife or livestock in Maine that help inform us about emerging issues or educational outreach needs.
- **Michael Burman, University of New England:** The audiences are so enthusiastic. This is THE place to reach a general audience in Maine.
- **Julie Peterson, University of New England:** The MSF provided an opportunity to connect with the public and share social science research on implicit bias—a subject that has received much popular press, but not quite as much press on the actual psychological mechanisms responsible for these types of biases.

Festivalgoers

- The 5 Minute Genius [event] is my favorite and I continue to be so amazed at all the wonderful stuff going on in Maine.
- The scope of this festival was far beyond what I could have even imagined. It was...the best weekend of [my daughter's] life.
- After attending the MSF, I was amazed at the small and medium sized manufacturing businesses that rely on STEM graduate(s), both at a university level and at the community college level.
- We found one of the best things about the festival was that there were events for all ages.
- I just wanted to let you know how much my family enjoyed the festival. It was so much more than we had expected.
- We've come every year since you started, and it keeps getting better.