



Image courtesy of Paul Cyr ©



A Recent Conference on Out-of-School STEM Learning in Rural Settings: Interim Report

The Rural Informal STEM Learning Conference, sponsored by the National Science Foundation (NSF) and held at its headquarters on September 13–14, 2018, was the first of its kind to bring together key innovators and experts in rural STEM learning outside of school. People who live in rural settings are a frequently overlooked and significantly under-represented STEM audience. At the conference, which was led by the Maine Mathematics and Science Alliance, we addressed this key question: *How can we build on recent innovations to create more effective experiences and pathways for informal (out-of-school) STEM learning in rural communities?* Over the last decade, NSF has funded a small, committed group of organizations to design and conduct small-scale experiments in enhancing informal STEM learning in rural areas. These innovators, along with policy experts and STEM organization leaders came together to synthesize the work done so far, and to map out the synergies and fruitful directions going forward.

The gathering comprised approximately 30 conference participants representing key sectors of the rural STEM learning ecosystem, including experts on library programs, adult and community education, family outreach, citizen science, and educational programs offered by field stations, universities, research institutes, and science centers. Experts on rural sociology and demographics also participated, providing important context about the features of rural areas, which are home to a diverse group of roughly 60 million Americans (<https://www.census.gov/newsroom/press-releases/2016/cb16-210.html>).

The conference focused on these topics:

- What we understand about rural places, how we define them, and the role of rural identity;
- Diversity and equity in rural STEM education outside of school;
- Principles of effective program design in rural Out-of-School Time (OST) settings;
- Community building and working with partners in rural STEM learning ecosystems;
- Measuring the impact of rural STEM learning programs—are there different metrics?
- Guiding principles for expanding successful programs.

Rural places are hugely varied; participants worked to articulate what is special about rural areas, what makes it hard to implement STEM learning programs, and how to recognize and capitalize upon the special assets of rural areas. Common descriptors of rural places (in addition to low population density) included the sense of connectedness to each other and to the land, the presence of deeply-rooted organizations (libraries, schools, sports teams), the problems

associated with long distances between places, the apparent paucity of STEM business and industry, and the challenges of getting access to communications technology.

Participants also identified special factors that should be considered when doing educational research in rural areas. These ranged from methodological problems with sampling in small communities, to participants' reluctance to be surveyed, to issues of forming trust between community members and researchers "from away." Participants agreed that even a hint of the attitude, "I'm from <a large city> and I'm here to help" was both easily recognizable and soundly rejected in rural communities. It was noted that a mixed-method approach combining narratives about program impact, supplemented with statistics, might be considered best practice in rural settings.



Image courtesy of Paul Cyr ©

With respect to next steps, participants offered many suggestions, including the following:

- Fund programs that reflect the diversity of rural communities;
- Ensure that all programs include genuine participation (collaboration or co-development) from members of the rural communities;
- Take into account the time and effort needed to build lasting relationships;
- Determine the circumstances under which rural school and out-of-school organizations should be collaborating and pooling resources;
- In each project that includes research, encourage participation of at least one researcher who lives in the rural community being studied;
- Devote more attention to distance learning, and to building the infrastructure that enables distance learning;
- Examine "intersectionality" of identities, such as the intersection of rural identity with gender, race, membership in a tribal group, or disability status.
- Include a multiplicity of rural voices, given the diversity of needs/assets;
- Fund a network of rural research and development organizations working in the STEM out-of-school arena, enabling these organizations to share their work more easily;
- Synthesize what research is showing regarding equity of opportunities for rural residents in STEM learning.

Dr. Paul Jennings, the NSF Program Officer whose interests in rural settings first sparked the conference, concluded by urging educational researchers and policy makers to "provide models for the nation" about exemplary rural STEM learning practices. The work is just beginning, and must examine learning opportunities for youth, adults, and communities at large.

A full report is anticipated in early 2019, at www.mmsa.org/RuralConference2018. Parties interesting in participating in dissemination events should contact sallen@mmsa.org.



This material is based upon work supported by the National Science Foundation under Grant No. 1823383. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.