TRUST IN ENVIRONMENTAL RESEARCH PERFORMED BY K-12 STUDENTS AND COMMUNITY VOLUNTEERS

Teresa Thornton¹, and Jessica Leahy²

¹231 Nutting Hall, School of Forest Resources, University of Maine, Orono, ME, 04469, USA; ²241 Nutting Hall, School of Forest Resources, University of Maine, Orono, ME, 04469, USA.

Introduction
Trust from scientists, governing boards, and local professionals in environmental research generated from K-12 educational programs can be beneficial to communities that need large quantities of data in a short period of time in order to protect their natural resources. In New England, there are more than 2.3 million homes that use unregulated private wells as their drinking water source. Environmental research performed by K-12 students and community volunteers can help communities protect impaired drinking water sources. Although the scientific community has validated student results through their use in peer-reviewed journal articles and tested student-collected data against professionals’, research regarding trust in environmental research generated from K-12 students in a community-based environmental monitoring research (CBEMR) project has not been investigated thoroughly.

Objectives
1) Describe volunteer perceptions of their communities’ trust in student results
2) Identify participant perceptions of a CBEMR project
3) Explain factors that influence participant trust in student-generated scientific results

Literature Review

Familiarity
Frequency of Interaction
Risk Perception
Historical Trust
Interpersonal Trust
Organizational Trust
Trust in Student Data

Results
Community Perceptions of Student Data:
• Most participants felt that the community would trust the data because it came from local knowledge. The community knew and trusted the participants. Information was not handed down from some unknown scientific entity, but came from trusted individuals with whom the community was already familiar.
• Some participants felt that community members would decide to trust the CBEMR or student-generated data based on their own worldview.
• They also felt that if someone thinks they may have to change their behaviors based on the CBEMR results, they may chose not to accept the data.

Participant Perceptions of CBEMR:
• There was a consensus among all participants that the program was an efficient way of disseminating important drinking water information throughout the community.
• They felt that using the school as a center of the project allowed for a diverse group of people to be involved and to hear the message.

Most volunteers considered professionals in their field as valuable sources of knowledge.

Methods
• The setting for this research was five states within New England.
• Approximately 70%-100% of their homes using private well water as the primary drinking water source.
• At least 60% of the student body used private well water.
• Students ranged from fifth grade to high school seniors.

Qualitative semi-structured interviews were conducted before and after participation in the CBEMR. More than 40 interviews in the five states were conducted with:
• Environmental, Chemistry, or Science Educators
• School or County Administrators
• Geographic Information System (GIS) Specialists
• Conservation District Employees, Conservation Commission Representatives, Forest Supervisors, or Watershed Coalition Directors
• Science Education, Geology, or Oceanography Professors
• Laboratory Scientists
• Health Department Representatives
• Local Business Owners: civil and environmental engineers
• State Geologists
• Town Planners and/or Town Engineers
• Community Volunteers: parents or retired citizens

• Trust in student data or the GET WET! program is based on interpersonal, organizational, and scientific trust.
• These types of trust are based on historical, role, and dispositional trust.
• These types of trust are based on risk perception. Risk perception was different for groundwater professionals and laboratory scientists than for educators and non-scientists.
• All participants based risk on familiarity of participants, testing procedures, the ease of the tests themselves, and their belief in student capabilities.
• Groundwater professionals and laboratory scientists added knowledge of scientific methods including easily recognized anomalies, professional certifications, and QA/QC.
• Laboratory scientists did not trust student data under any circumstances, but all participants trusted the GET WET! program to provide excellent opportunities for students and communities.

Conclusion
• School-centered CBEMR may be considered a valid method of information dissemination, but if the scientific community does not trust the student and community-generated data, then the scientist versus non-scientist paradigm will continue.
• Consecutive years of success with QA/QC validation of student-generated data may change laboratory scientist’s perceptions. The program may gain greater scientific validation through repetition, thereby affecting laboratory scientist’s trust in student-generated data.
• It would also be interesting to study CBEMR effects on student interest in environmental concerns, local politics, science careers, school-centered collaborations, and drinking water resources.