Soil and Plant Science Division

Technical Soil Services

Northeast Soil Survey Region

Support for the 2026 New Hampshire and Vermont Envirothon Competitions

St. Johnsbury, Vermont, Major Land Resource Area (MLRA) Soil Survey Office (SSO)

Purpose

On May 19 and May 27, 2026, at the request of the NRCS New Hampshire and NRCS Vermont resource soil scientists, staff from the St. Johnsbury MLRA SSO ran the soils stations for the annual New Hampshire and Vermont Envirothon competitions, respectively. These competitions foster interest in environmental science by providing hands-on opportunities to evaluate soil profiles and inspiring students to pursue agricultural and soil science careers. As the soils lead, the St. Johnsbury staff helped moderate the time and answered questions from students, volunteers, and partners on soil science, soil mapping, other soil related topics, and careers within the NRCS.

Background

Envirothon competitions test teams of high school students from across the state on their knowledge of five topics—soils, forestry, wildlife, aquatics, and a current issue (this year's being nonpoint source pollution). St. Johnsbury staff coordinated with local conservation district staff, State NRCS staff, and retired soil scientists to provide an open soil pit for students to study and answer questions based on their classroom learning. The St. Johnsbury staff also created the questions, mainly focusing on the soil pit they had dug and described at the Envirothon competition locations. They performed the reconnaissance for the soil pit location the day before each of the competitions to find the optimal place to dig. This ensures there is nothing too tricky for entry level students, who range from freshmen to seniors in high school.

On May 19, the New Hampshire competition took place at New Hampshire Technical Institute (NHTI), located in Concord. This location exists within MLRA 144A, Southern New England and New York, along an oxbow lake that was once the main channel of the Merrimac River. This competition had over 100 students and volunteers, in teams of 4 plus a teacher or mentor, rotate through the soils station. At the station, they were given a test that required them to texture and color the soil pit and answer multiple choice questions on soil forming processes.

The St. Johnsbury staff classified the soil in the pit as Rippowam, a poorly drained sandy or coarse-loamy alluvial soil, providing a good example of redoximorphic features close to the surface for students to describe (fig. 1). The natural vegetation of this area supports silver maple flood plain forests, dominated by a silver maple overstory and a sparse understory of forbs such as sensitive fern and shrubs such as alder and dogwood. Recent rains caused evident flooding in the surrounding forest, leaving the original soil pit location under a few inches of water. As a result, St. Johnsbury staff moved the soil pit location just outside the flooded area. It was still within sight of the old location, which was a good example to students of alluvial deposition and flooding conditions.

Figure 1.—New Hampshire Envirothon soil pit. A dark surface horizon of organic matter is present, underlain by sandy brown colored matrix with red redoximorphic features (iron depletions).

On May 27, the Vermont competition took place at Buck Lake Wildlife Management Area located in Woodbury, Vermont. This location is within MLRA 143, Northeastern Mountains, on rugged mountain slopes within the northern Vermont Piedmont. This competition had over 50 students and volunteers, in teams of 5 plus a teacher or mentor,

rotate through the soils station. At the station, they were given a test that required them to texture and color the soil pit and answer multiple choice questions on soil forming processes.

The St. Johnsbury staff classified the soil in the pit as Vershire, a well-drained coarse-loamy till that typically has interbedded phyllite and metamorphosed limestone or shist bedrock within 91 centimeters (36 inches) (fig. 2). The shallow soil pit described for this competition provided good examples of bedrock and mineral substratum layers that were included in the soils test. The natural vegetation of this area supports mixed northern hardwood forests, dominated by eastern hemlock, red or sugar maple, yellow birch, and American beech. Students would often finish the test early and spend the rest of the time asking the St. Johnsbury staff about tree identification, what these steep forested areas can be used for, and how these soils came to be formed this way.

Figure 2.—Vermont Envirothon soil pit. A thin surface horizon of organic matter is present, underlain by loamy textured till with phyllite bedrock emerging around 40 centimeters (16 inches).

Key Outcomes

During both Envirothons, the students were excited and eager to get their hands dirty after months of learning in the classroom. These competitions provide students with hands-on environmental education. Testing students on the five topic areas—soils, forestry, wildlife, aquatics, and a current issue—helps foster skills, such as critical thinking, and helps immerse students in real-world natural resource management. By providing the soils station, the St. Johnsbury staff help students learn about different soil processes and expose them to careers in soil science.

Like the students, the St. Johnsbury staff were excited and eager to be out in the field, seeing the months of project planning and preparation for each competition finally coming together. St. Johnsbury staff have run the soils stations for the last several years and have received high praised from the Envirothon staff for their assistance in running the soils stations. Besides drafting, delivering, and grading the annual soil exams for these competitions, NRCS staff occasionally provide in-person instruction at after-school Envirothon club meetings. These meetings provide another opportunity for NRCS staff to answer questions about NRCS and other natural resource careers that high school students may aspire to in the future.

Many thanks to everyone who assisted in running the Envirothon soils stations this year. Cheers to another year of successful Envirothon competitions!

Figure 3.—Students (left) gathering around the soil pit while other students (right) take written exams at the New Hampshire Envirothon.