

Press Release

Mississippi Valley Field Naturalists

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Field Naturalists deliver ‘water smarts’ to Grade 8’s through drinking water source protection education

by Pauline Donaldson

The Mississippi Valley Field Naturalists (MVFN) are pleased to sponsor an environmental education program for Grade 8 students in 7 local schools in the Mississippi Watershed this year. *Engaging Grade 8’s in Source Protection Planning* was launched with the financial support of an Ontario Ministry of Environment Drinking Water Stewardship Program grant received last May. The objective is to provide experiential curriculum-linked learning of basic environmental stewardship concepts related to drinking water source protection (both ground and surface water sources) under Ontario’s *Clean Water Act*.

Last June, MVFN hired Nature Works Learning of Mississippi Mills, to conduct the program. The fall sessions were held from September to December 2009 at R. Tait McKenzie Public and Holy Name of Mary Catholic School in Mississippi Mills, Caldwell Public and Notre Dame Catholic School in Carleton Place, Huntley Centennial Public School in Carp, and Maple Grove Public and Sacred Heart of Jesus Catholic School in Lanark Highlands. With the bulk of the in-class programs completed, schools should now be busy implementing the action plans which they developed following the student-conducted ‘ecoreviews’. In all, over 185 students have been engaged in some very interesting exercises bringing to life how water cycles in the environment, where and how drinking water comes to them, and what affects the quality and quantity of their drinking water.

An introductory presentation on the *Clean Water Act* included a video about the water cycle. Earth’s fresh water supply, vital to humans and all life, circulates as precipitation (rain and snow) which is then taken up by plants, enters surface water bodies (lakes, rivers etc.), seeps through the ground ‘recharging’ underground water reserves (aquifers), and then ‘cycles’ back to the atmosphere via evapotranspiration.

Following the introduction, students began a hands-on hydrogeology exercise in which they created their own groundwater models, complete with ‘wells’ in large clear plastic containers (**Photo 1 a, b**). They followed what happened in their ‘wells’, for example, when they pumped water out (with a syringe), when it ‘rained’ (simulating recharging of groundwater aquifers), or when they introduced a ‘contaminant.’ After watching the changes in their models, students were able to make deductions about the effects of precipitation, contaminants, and water table level on the quantity and quality of water in real-life underground aquifers such as those supplying fresh drinking water to municipal and private wells for most of Mississippi Mills, Carp, and Lanark. Discussion emphasized groundwater as an important resource and the key role of land-use planning in preventing contaminants from entering groundwater sources of drinking water, particularly on land near municipal wells (well head protection areas).

To understand surface water quality issues, such as for water in the Mississippi or Tay rivers (which provide drinking water for the towns of Carleton Place and Perth), students measured turbidity, temperature, pH and dissolved oxygen in several water samples. They discussed the meaning of the results and asked the following: Is this water good for drinking? Is this water good fish habitat? Why? They discussed what might affect these and other water quality parameters. Examples included runoff from river banks and the influx of dirty discharged stormwater. They talked about how threats to water quality at drinking water intake areas might be reduced, for example through proper stormwater management and maintaining wetland buffers.

In a third hands-on lesson, students considered the universal right of all humans to fresh drinking water and the concept of global limits to this supply. In groups they chose a virtual meal and calculated its ‘virtual water’ content. The virtual water content is the sum total of all the water used to produce the food. Using a scale of one large paper water droplet per 100 litres of water, students illustrated to fellow students, the ‘water footprint’ of the meal they chose (**Photo 2**). When thinking about water quantity, students looked at ways to conserve water in the school and at home and considered who the main users of local water reserves are; they include some industrial water takers, municipal and private wells.

In addition to these fun activities in the classroom, the students were also given the opportunity to visit water and waste water treatment facilities in their own or adjacent communities. On these field trips they saw and heard first hand from municipal

operators and employees from the Ontario Clean Water Agency about how these facilities worked. In the Mississippi Mills area the field trip included a tour of waste water treatment facilities at the Almonte sewage lagoons (**Photo 3 a, b**). Students also toured the operating system for the two wells near the Almonte water tower, which are part of the drinking water source for the Mississippi Mills urban area. This included an explanation of the water distribution system and the role of the water tower. Students were also toured around side roads by bus, to get a sense of how long it takes for water contaminants to seep underground and reach the wells and to understand the vulnerability of well-head protection areas to contamination. Carleton Place students toured the water treatment facility for surface water drawn from the Mississippi River as well as the waste water treatment facility in their town. Lanark students whose homes are largely served by private wells and septic, toured water and waste water treatment facilities at nearby Perth where surface water sourced from the Tay River is treated and treated waste water is returned to the river.

Finally, a project which was inspiring for many students was the opportunity to investigate and improve practices in their own schools with respect to water use and water protection. During drinking water source protection ecoreviews, teams of students toured classrooms, hallways and bathrooms. They interviewed other classes, as well as school staff knowledgeable about facilities maintenance and storage practices, including school custodians and principals (**Photo 4 a, b, c**). Are students encouraged to use water wisely? Is water being wasted due to high flow rates in sinks, leaking taps and toilets, or from taps being left on? Are water-saving devices such as aerators, low flow toilets, and toilet dams being used? Are rain barrels used on the property outdoors for watering gardens? Do the school grounds allow adequate groundwater recharge? Are hazardous products such as salt, fuel, and paint stored properly, or are items such as batteries and electronics disposed of in a manner which will not prove a threat to drinking water sources, now or in the future? The students rated their school's level of implementation and, based on the results, they worked together to develop a specialized action plan for their own school. These are being implemented this winter.

In April, Nature Works Learning will be returning to the classrooms to do follow-up ecoreviews to see what improvements to source water protection have been made in the schools. Students should also hear how the water quality of the water samples they obtained for two local rivers, the Mississippi and the Clyde, compare to worldwide results registered through the 'World Water Monitoring Day' program.

To date, MVFN's *Engaging Grade 8's in Source Protection Planning* has progressed well and by all accounts has been a great success. As a conclusion to the program, it is anticipated that some students will make a submission to the Mississippi Rideau Source Protection Committee later this spring. For further information about this program please contact MVFN's Board member and Environmental Education Chair Brenda Boyd at 613-256-2706 or bjboyd@sympatico.ca.

Photo 1a: Notre Dame Catholic School students look closely inside their groundwater models after a contaminant is added. *Photo courtesy: Patricia Larkin* **1b: A team from Huntley Centennial School in Carp, begins construction of their groundwater model.** *Photo courtesy Marg Graff.*





Photo 2: Students at Notre Dame Catholic School demonstrate the water footprint of their meal. On a scale of one water droplet per hundred liters of 'virtual water' used to produce the food, our water footprints were this big! Photo courtesy: Patricia Larkin



Photo 3 a, b: During MVFN's *Engaging Grade 8's in Source Protection Planning* students saw and heard first hand about municipal drinking water sources and wastewater treatment. Shown are students taking part in a tour of Mississippi Mills' wastewater treatment facilities at the Almonte lagoons. *Photos courtesy Patricia Larkin*



Photo 4 a, b, c: Teams investigate school fixtures and practices to design water conservation and source protection plans for their school. At R. Tait McKenzie a pair brainstorm to write their action plan (left); at Maple Grove in Lanark, the flow rate in a classroom tap is checked (right); and at Notre Dame, a group interviews their school principal, Dave Chaplin (bottom). *Photos courtesy Patricia Larkin*

