

Litzsinger Road Ecology Center

COMMUNITY NEWSLETTER

www.litzsinger.org

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December 2015

Creating a Class of Problem Solvers

by Bob Coulter

Neurophilosopher Patricia Churchland describes problem solving as “part of your general capacity to do smart things and to respond flexibly and productively to new circumstances.” While it’s hard to argue with these premises, in fact doing smart things and responding flexibly and productively are skills that are surprisingly undervalued in school—for teachers and students alike. Teachers have their courses pre-scripted, and the kids are given “problems to solve” which they have no hand in identifying, and which have only one path to a “correct” solution. It’s a rare school which fosters a broader and richer concept of problem solving like the one Churchland offers

So, I challenge you to make a new year’s resolution: For your own practice and the work the kids do, find ways to do truly smart, flexible, and productive thinking. Work with the kids to identify new problems (not just the ones set for them), look for alternative ways of solving them, and

compare and contrast what each solution illuminates. Three of the Litzsinger Road Ecology Center staff graduated from Antioch University New England, which uses the tag line “Because the world needs you now.” Being a good problem solver is a big part of why we’re needed. ✨

A student experiments with an Enviroscope model. Learn about a variety of resources available to help you teach about watersheds on page 2. Photo by Eddie Jones.



Activity Spotlight: *What's Your Watershed Address?*

by Leslie Memula

What's Your Watershed Address? is a series of lessons chock full of great information for teaching students about watersheds, pollution, erosion, and sedimentation—all of which are evident in our urban environment.

“Activity 3.2: Student Investigation of Watershed Concept” is a simple hands-on activity where students construct a watershed model using aluminum foil. They can observe what happens when it rains (by using a spray bottle), manipulate the foil to see how the water might change paths, and begin to think about how pollution affects their watershed by using food coloring.

You can then head outside to investigate your school's watershed more closely in “Activity 3.3: Student Investigation of Land Use and Pollution within a Watershed.” Students can work to identify potential sources of pollution, look for signs of erosion, and think about what they can do to reduce pollution in their schoolyard.

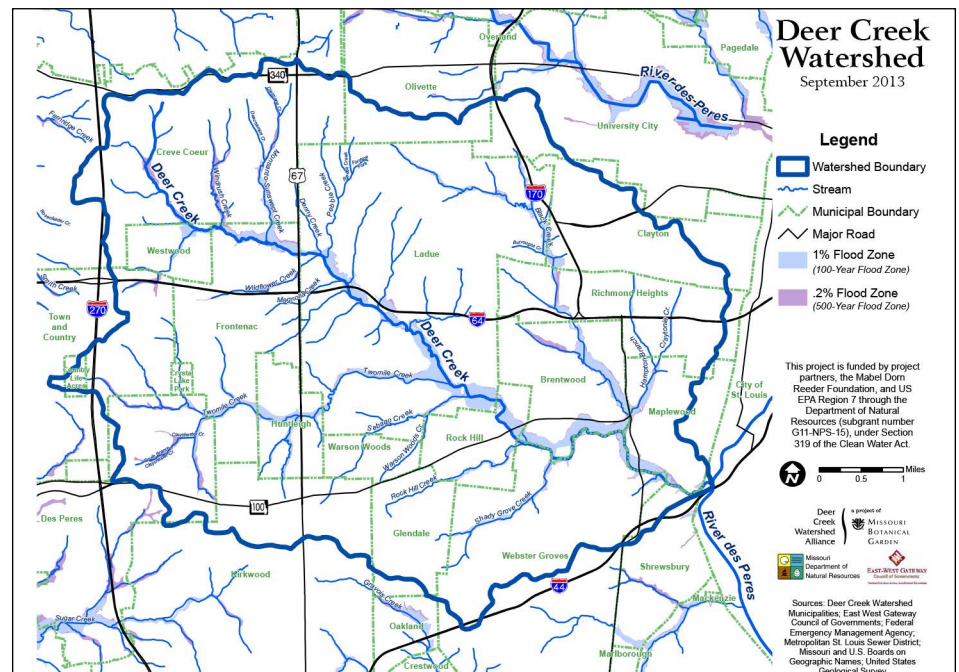
You can borrow the portable [Enviroscape](#) model from LREC to further examine the effects of non-point source and point source pollution in a typical watershed.

By helping students understand the watershed concept, they begin to recognize that what happens on the land affects the water. Even more importantly, they become informed citizens who can go out and make changes to benefit their school and home communities.

What's Your Watershed Address? is a chapter from [Conserving Missouri's Aquatic Ecosystems \(CMAE\)](#)—one of five instructional units developed by the Missouri Department of Conservation as part of their Discover Nature Schools program. Check out the high quality student books

and teacher's guide, which can be obtained free of charge for Missouri teachers.

An additional resource that Danelle Haake, LREC Restoration Ecologist (and stream aficionado) shared with me, is the [Land and Water Education Resources for Northeast Missouri](#). This booklet was compiled by Mary Culler, Northwest Region Watershed Coordinator with the Missouri Department of Natural Resources and includes information about activity guides, programs, interactive displays and on-line resources. As Mary states in the welcome, “Where ever your school is in Missouri, your students share this common theme—they live and walk on land that drains water eventually to the Mississippi River.” It would be well worth your time to check it out. 🌿



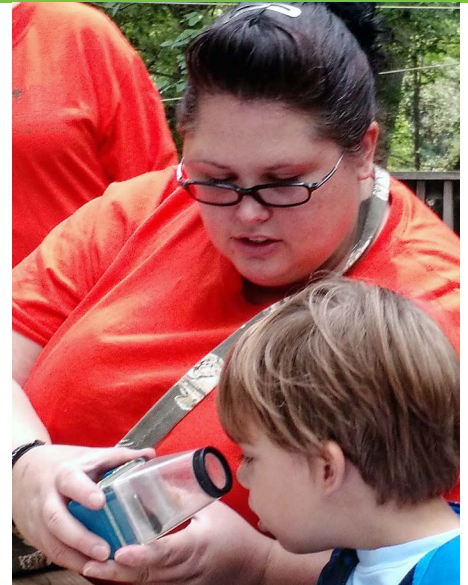
Additional Deer Creek Watershed maps are available at <http://www.deercreekalliance.org>.

Meet Layla Funke

By Eddie Jones

This past fall we have had the privilege of working with a young lady who is completing an education internship through her study program at Webster University. For the past three months, two or three days per week, Layla Funke has worked with, and learned from, the Tuesday and Friday Horticulture Volunteer teams, a team engaged in bird studies at LREC, and school children from a whole host of schools. Layla has organized teaching materials for us and submitted a plan to help us work more effectively with our teacher partners. She will soon graduate with a degree in Educational Studies.

What follows is her account of her time at LREC. Thank you, Layla!



Layla Funke with a young learner.
Photo by Eddie Jones.

My name is Layla Funke and I am student at Webster University in St. Louis. I am working towards achieving a Bachelor of Arts in Educational Studies with science as a minor. As a requirement for the capstone of my degree, I am to complete 135 hours of an internship in any area of my choosing. In an effort to maintain my knowledge and skills in the field of education I know I wanted to work in a learning environment. However, I also wanted to find an area where I could incorporate my love of the sciences, more specifically speaking, environmental sciences.

Among the different sites of which all educational studies interns could choose from as a best fit for their skills and educational background, The Litzsinger Road Ecology Center (LREC) was one of them. Seeking to fulfill my desire for working with nature and hands-on, place-based forms of education, I reached out to the LREC before the fall semester had even begun. After being accepted on as an intern with Litzsinger, I was immediately provided multiple opportunities to learn more about the site by becoming familiar with the different types of plants and animals.

The staff was incredibly welcoming and has made it a point to do all they can to help me reach my full potential as a volunteer intern. My experiences have included the study of native plant species, the removal of invasive plant species, the effects of watershed erosion, the collection and cleaning of seeds, the handling of different species of insects, the observation of turkeys and deer in their natural setting, the notice of changes of seasons, and the coverage of woodland, prairie, and creek bed terrain. I have also had the opportunity to observe and gently assist local birders in the capture, tagging and recording of at least over 25 different species of bird. However, the opportunity to participate, and then lead, groups of students from

See **Layla**, page 4

From **Layla**, page 3

surrounding area schools, has perhaps been one of the most beneficial experiences by far.

To have the chance to witness the twinkle in a child's eye, when he or she sees a part of nature that they have never noticed before is simply priceless. No matter where the students come from, what their background, or how they behave in a classroom, once they are brought into the outdoors and are provided with structured exploration, parts of the world around them that they have never connected with before begin to open up. It has been the opportunity to witness, in person, this connection taking place that has forever facilitated in me the drive to want to help flourish the connectedness that all students have the potential to achieve through outdoor education. All of this and more is what can be gained from an internship with the Litzsinger Road Ecology Center. I would, and will, recommend this site as an excellent place for future interns who are genuinely interested in the area of outdoor, place-based education. ✍



Layla Funke exploring the outdoors with her kids. Photo by Layla Funke.

CALLING ALL TEACHERS!

LREC ALL-DAY TEACHER WORKSHOP

As a teacher who partners with Litzsinger Road Ecology Center, you are invited to attend a no-cost workshop to share nature education successes and challenges with like-minded colleagues. The workshop will be held **January 28, 9am to 3pm at Litzsinger Road Ecology Center.**

We will be inviting a few of you to more formally present some aspect of your outdoor teaching experience that will benefit your colleagues at other schools. LREC staff will provide some additional resources to extend your outdoor teaching skills and strategies for networking with other schoolyard educators. This workshop is open to all LREC teacher partners. Lunch is provided.

Let your Litzsinger contact person know if you plan to attend and if we can help you get release time for the day. Thank you!



LREC teachers investigating seeds. Photo by Eddie Jones.

LREC Research: Prairie Diversity

By Danelle Haake

Every summer, we spend several days identifying plants that are growing in our prairies. After doing this for several years, we began to notice patterns:

- Foxglove beardtongue (*Penstemon digitalis*) is very common in our prairies, but we see a lot of ‘basal rosettes’—plants that do not have flowering stalks.
- The North Prairie has a lot of sweet coneflower (*Rudbeckia subtomentosa*) and it’s the only place we could find Virginia bunchflower (*Melanthium virginicum*).

Recently I’ve become aware of tools that have helped us to look more closely at the data we’ve been collecting each summer. Using a program called ‘R’, we can study the diversity of our prairies to answer questions like, “Which prairie has the most plant diversity?”

Plant diversity is something that we consider when managing our landscape. The more species of

plants we have, the more likely that we will be able to support more species of animals, including pollinators like bees and butterflies.

There are several ways to measure diversity (Table 1). The simplest is to just count the number of species that are found in an area; doing this (first column of Table 1), we see that the North Prairie has the most species and the Pasture Prairie the fewest. But when we put more effort into counting species in one area than another (we have a lot more monitoring points in the North Prairie than in the others), it is useful to standardize our measurements of diversity using a method called *rarefaction*. When we do this in our prairies (second column of Table 1), the diversity is reversed, with the Pasture Prairie having the largest standardized diversity.

Another thing we can consider when looking at diversity is the similarity of the species to one another. For example, if an area



Virginia bunchflower (*Melanthium virginicum*).
Photo by Suzanne Cadwell.

Rarefaction is a mathematical technique that resamples from the original dataset to create a curve that helps us to identify how frequently in our sampling we come across a ‘new’ species. The curves grow quickly at first, because every species found at the first site is a new species and probably several species found at the second and third sites as well. As more and more sites are sampled, the chances of finding a new species gets smaller and smaller.

has ten species and six of them are coneflowers and the other four are sedges, that is not really as diverse as an area with ten species that are each from a different group. When we take the similarity of the species into account (third column of Table 1), the three prairies actually have similar diversity.

In the end, this mostly tells us that, though the three prairies are different, none of them is functioning better than another when it comes to providing opportunities for the growth of a wide range of plant and animal species, or opportunities for students to explore the diversity that nature has to offer! ✨

	Number of Species	Standardized Diversity	Diversity Considering Species Similarity
North Prairie	101	35.0	22.8
South Prairie	92	37.2	22.4
Pasture Prairie	69	39.2	24.0

Table 1. Diversity in the prairies of LREC. Data collected 2013–2015.

Glass House Quiz: Watersheds

by Danelle Haake and Deanna English

We hope you have all heard of watersheds before, but in case you haven't, we would like to get you familiar with the term. A watershed is a drainage basin. It is the area of land that collects water that flows into a stream, river, or lake (or rain garden).

Everything that happens in a watershed can have an impact on the water in the receiving waterbody. For example, if there is an oil spill in the watershed, spilled oil will be carried into the nearest waterbody. Most water pollution (fertilizers, pesticides, trash, oil, metals, etc.) starts in the watershed and is washed from the land to the water.

We hope to see you in our part of the watershed sometime soon!

1. Where would you find a watershed?

- a) urban area
- b) rural areas
- c) in the ocean
- d) both a and b
- e) all of the above

2. Who lives in a watershed?

- a) people with houses along a stream
- b) people living within two miles of a stream
- c) people with a leaky roof
- d) everyone

3. If you live in a watershed, do you live in only one watershed (assuming you have only one home)?

- a) yes
- b) no

4. Which river has the largest watershed in the U.S.?

- a) Yellowstone River
- b) Colorado River
- c) Mississippi River
- d) Missouri River

DECEMBER

by Martha M. Schermann

Discovering

Earth

Creates

Energetic

Moments

Bringing

Enriched

Remembrances



See **Quiz**, page 7

From **Quiz**, page 6

5. **Watersheds are important for the health of all the organisms (including humans) within that watershed. Trash, herbicide, fertilizers, road salts, and other stuff that is deposited on the land will move through a watershed. When trying to identify and manage pollutants, what's the difference between point and non-point pollutants?**
- a) Point source pollutants are those we need to worry about. Non-point pollutants have little or no impact on the environment.
 - b) Point source pollutants can be traced to a single source. Non-point pollutants come from a broad area or a number of sources.
 - c) Point source pollutants are pollutants we can point at and tell someone to clean up. There is no such thing as non-point pollutants.
 - d) Point source pollutants are pollutants that can be identified. Non-point pollutants are those that are unidentifiable.
6. **What are some ways that the staff and volunteers at LREC are working to protect the health of the Deer Creek watershed?**
- a) working to protect the health of the woodlands (riparian zone) and the prairies (floodplain)
 - b) installing rain gardens and rain barrels to slow the flow of water across the Ecology Center property
 - c) participating in periodic water monitoring and macro invertebrate monitoring of Deer Creek and other streams within the Deer Creek Watershed
 - d) both a and b
 - e) all of the above

See **Quiz**, page 8



Volunteer Holiday Party

**MONDAY, DECEMBER 7, 2015,
11AM TO 2PM**

AT ELIOT UNITARIAN CHAPEL
100 S. Taylor, Kirkwood 63122
(One block east of Kirkwood Road,
at the corner of Argonne and Taylor)
[Download map and parking tips](#)

Come enjoy some holiday cheer in the way of food and hot apple cider! Mingle and jingle with other Horticulture and Education Volunteers and LREC staff.

RSVP to Martha and let her know how many people will be coming: 314-540-4068 or martha@lrec.net.

*Completely optional:
In honor of Peter Fischer, we are collecting for Operation Food Search.*

If you'd like to participate, you can bring non-perishable food items or a check payable to "Operation Food Search" to the party and we will deliver them. Monetary donations can also be submitted online at <http://operationfoodsearch.org>.



From **Quiz**, page 7

Answers:

1. **d) Both a and b.** Anywhere that rain falls on land, there is a watershed, because the water that falls will then flow downhill across the landscape.
2. **d) Everyone.** We all live in a watershed.
3. **b) No.** Every location is in multiple watersheds because watersheds are nested inside one another. For example, LREC is in the Deer Creek watershed, the River des Peres watershed, and the Mississippi River watershed.
4. **c) Mississippi River.** The Mississippi River watershed covers 1,245,000 square miles or 41% of the contiguous U.S. (<http://water.epa.gov/type/watersheds/named/msbasin/marb.cfm>). The Yellowstone River watershed is part of the Missouri River watershed, which is part of the Mississippi River watershed. The Colorado River watershed is separate from the others and is about a fifth of the size of the Mississippi River watershed.
5. **b) Point source pollutants can be traced to a single source. Non-point pollutants come from a broad area or a number of sources.**

6. **e) All of the above.** For example, LREC staff and volunteers, as members of a Missouri Stream Team, regularly monitor water quality onsite and surrounding stream sites. Useful data from this monitoring has been gathered



Staff member Susan Baron and volunteer Marilyn Claggett look for macroinvertebrates in Deer Creek. Photo by Eddie Jones.

and alerts sent to the Department of Natural Resources about possible pollution problems. In addition, Danelle has entered a PhD program to study the effects of road salt on the health of our streams. ✍

LREC Announcements

December 7

Volunteer Holiday Party

11 am to 2pm at Eliot Chapel. Details on page 5.

December 9

Burning Questions Q & A

2:30 to 4pm at the Glass House. Drop by to get answers to your questions about the prescribed burns at LREC. This is taking the place of our volunteer enrichment on prescribed burning. All volunteers welcome! Snacks will be provided. No RSVP required.

January 13

Volunteer Enrichment: Resources for Winter Learning Activities

12:30 to 3pm in the Barn. All volunteers are invited to get updated on LREC resources for winter outdoor learning activities. We will utilize some of these resources as we explore the LREC habitats. Bring your sack lunch at 12:30pm; activities begin at 1pm. RSVP to Martha: martha@lrec.net or 314-540-4068.

January 28

LREC All-day Teacher Workshop

9am to 3pm at LREC. Details on page 4.

Local Events

December 1, 8, 15, or 22

Gardenland Express Early Childhood Programs

At Missouri Botanical Garden. Bring your preschool class to enjoy the train show, complete a craft, and learn about conifers. Cost is \$75 for up to 25 students. Learn more/register by calling 317-577-5185.