PEEC
Pocono Environmental Education Center

Autumnal Equinox 2013
Seasons
A Quarterly Publication to Advance Environmental Literacy

INSIDE THIS ISSUE

Pocono Environmental Education Center

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Make Way for Mushrooms!

By Bonnie Koop

Reprinted from Autumnal Equinox 1995

Autumn is the season in the Delaware Water Gap when residents and visitors alike spend much of their time looking up at the colorful forest canopy or the migrating raptors that soar over the mountain ridges. This fall, don't forget to turn an appreciative eye to the forest floor! Autumn is a cool and moist season which makes it a fantastic time to explore for mushrooms. Not only do mushrooms fulfill an important function in natural systems, but they are also beautiful, bizarre, and fun to study.

What is a mushroom?

Fungi are one of the most abundant life forms on the planet. Yeasts, molds, mildew, athlete's foot, and Dutch Elm Disease are all types of fungi. Two types of fungi-basidiomycetes (club fungi) and ascomycetes (sac fungi) -produce mushrooms. The mushroom is the fruiting body of the fungus, and it produces spores which are the fungus' reproductive units (Arnett 424). In short, mushrooms are to fungi what apples are to apple trees. Like the visible tip of an iceberg, the mushroom is only a small portion of the fungus. The fungus itself is a cobweblike net called the mycelium which grows in soil, leaf litter, or on other organic material (Phillips 6). Within twenty-four hours, one fungus can produce over a kilometer of new mycelium (Raven 213). The mushroom is produced after two mycelium of the same species fuse together (Arnett 424, Raven 234).

The structure of mushrooms varies depending on how they produce spores. Many mushrooms have gills on the underside of the cap on which billions of wind dispersed spores are produced. Bracket fungi, or polypores, and boletus mushrooms have smooth undersides made up of tubes and pores from which the spores are discharged. Puffball mushrooms house a large, powdery mass of spores inside an enclosed sac, and when the mushroom dries out and ruptures, the spores are released in puffs into the wind. Morels and truffles, often considered delicacies, are sac fungi. They develop spores in pits on the head of the mushroom. At maturity the spores are forcibly discharged into the air sometimes with an audible "puff" (Audubon 325).

Is a mushroom a plant?

Although fungi are often grouped with plants, they differ in two significant ways. First, plants reproduce through seeds, whereas fungi reproduce through spores. The other difference is the way plants and fungi obtain their nutrients. Plants contain chlorophyll which converts energy from the sun into nutrients for the plant. Fungi lack chlorophyll, and therefore cannot take advantage of the sun's energy. Instead, fungi obtain nutrients from organic matter, and there are three different ways they do this. Saprophytic fungi live on dead organic matter such as; rotting trees, dung, and leaf litter. Most of the fungi that produce mushrooms are saprophytes, and as decomposers they help break down the organic matter into soil. Some fungi are parasites; they draw their nutrients from living plants and animals (Knopf 12). Certain types of fungi form mycorrhizal associations

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Message from the Executive Director

Jeff Rosalsky

If you are reading this you probably already have an affinity for PEEC and our mission to educate about and inspire a passion for the environment and the wonders of the natural world. A concerned and involved PEEC community is essential for sustaining us as an organization to teach and to inspire the next generation of scientists, environmental leaders, and concerned citizens.

PEEC has thrived and grown as a direct result of donations of time and financial support from thousands of volunteers and donors over its 41 year history. As you will read through this issue of Seasons, we have had many interesting and new volunteer efforts. Several new trustees have joined the PEEC Board and we are still looking for a few more trustees who can bring skills and resources to improve the organization.

One of the most amazing volunteer driven efforts this summer was the SCI-Q project (see article), a summer science program funded by a grant from the Anne Spychala Family Charitable Foundation. Dr. Joy Karnas and her husband Brian Exton, as well as their cadre of fellow college professors, who volunteered their time, made the experience for 19 high school students truly extraordinary.

Over the spring and summer I have been working with another volunteer, Bill Woodrow of Princeton AlumniCorp, to seek manufacturer donations of energy efficient products to improve the PEEC buildings. So far we have received $10,000 of Wei Wala on-demand hot water heaters and thousands of dollars of insulation from BASF, with hopefully much more to follow.

I know that all of you reading this have skills and / or contacts that could have a dramatic effect on improving PEEC and the quality of our educational experience. Think of one call or email that you could make on behalf of PEEC that would make all the difference -- then do it.

PA Amphibian & Reptile Survey at PEEC!

By Molly Check

PEEC is hosting the Mid-Atlantic Center for Herpetology and Conservation (MACHAC) on September 28, 2013, from 2-3:30pm. Marlin Corn, from MACHAC, will give an informative presentation about the organization and its recently launched PA Amphibian and Reptile Survey (PARS). After the presentation, join us for a hike on the Two Ponds trail as we search for and identify amphibians and reptiles.

Amphibians, known for their split lives between the water and the land, include frogs, toads, and salamanders. Reptiles, terrestrial egg layers, include snakes, turtles, lizards, and skinks. Together, they are the "herps." These cold blooded animals make their home throughout the Poconos and are studied by amateur and professional herpetologists alike. Many amphibian and reptile populations face challenges from loss of habitat. In order to understand their decline and to help provide new habitat, the importance of on-going research cannot be understated.

MACHAC is a nonprofit organization dedicated to the conservation and study of amphibians and reptiles through advocacy, education, and execution of research by professional herpetologists and ecologists in the Mid-Atlantic and Northeastern United States. An impressive list of partner organizations includes the PA Fish & Boat Commission, the PA Dept. of Conservation & Natural Resources, the US Dept. of Agriculture, the US Fish & Wildlife Service, and the National Fish & Wildlife Foundation.

The PARS program, just one of the many MACHAC initiatives across the region, is specific to the lovely state of Pennsylvania. The survey is an important state-sponsored atlas project which will determine the current distribution and status of all amphibians and reptiles throughout Pennsylvania. Modeled similarly to Breeding Bird Atlases, this project will build upon previous atlas efforts. Combining modern technology with dedicated volunteer citizen scientists, this project is slated to run for 10 years and will culminate in a publication of the results.

Are you interested in becoming a citizen scientist? Join the PARS initiative and keep track of the spotted salamanders and wood frogs that you see, of the garter snakes and painted turtles. Together, our data will form a comprehensive picture of the local amphibians and reptiles which share our backyards, fields, and forests.

Make Way for Mushrooms!

Continued from page 1

with trees and shrubs in which the mycelium forms a layer over the plant's roots and helps the plant obtain phosphorus while the plant supplies the fungus with organic carbon (Raven 240).

How many kinds are there?

The fungi that produce mushrooms are an incredibly diverse group of organisms – there are over 55,000 species of basidiomycetes and ascomycetes combined (Raven 219, 230). The fungus you're probably most familiar with is the kind you find on top of your pizza. It's an Agaricus mushroom-the genus in which most store-bought mushrooms are found.

This genus of gilled mushrooms also includes the fungi you're most likely to find in your yard, but there are many other reasonably common mushrooms that are quite beautiful, like the coral fungi which were named for their resemblance to actual coral. There are other mushrooms that are downright bizarre. For example, the flesh of the lactarius mushroom exudes a colored latex, or milk-like substance when broken or bruised. Similarly, the bright yellow flesh of the Red-Mouthed Bolete instantly turns dark blue when it is bruised. Mushrooms can range in size from tiny to huge; puffballs can be as small as Stalked Puffballs which grow to less than half an inch high, and as large as the impressive Giant Puffball which can weigh up to ten pounds (Shuttleworth 86-88). Perhaps one of the eeriest fungal forms in the forest is the Jack O'Lantern; by day it brightens the forest floor with its bright orange color, but by night its gills give off a greenish glow.

Mushrooms can be found in almost every environment, but the most common places to find them are on dead trees, moist forest litter, and occasionally in fields. So when you set out on your autumn rambles this year, take along a mushroom field guide to help identify the fungi you find along the way. Two good guides are *Mushrooms of North America by Roger Phillips and Audubon's Guide to Mushrooms of North America* by Alfred Knopf. Please remember: wild mushrooms can taste wonderful, but some toxic species so closely resemble harmless mushrooms that the difference is only discernible on a microscopic level. As with other wild edibles, never eat a mushroom unless you are absolutely certain it is non-poisonous.

Bonnie (Koop) Hundrieser is a Senior Planner with the Regional Planning division in Duluth, MN.

MS Natural Resources / Environmental Education from the University of Wisconsin – Stevens Point.

New PEEC Trustees

PEEC is pleased to announce the addition of two new members to the Board of Trustees – Stephanie Kollar and Henry Skier. Both Stephanie and Henry bring new perspectives and experiences to PEEC and we look forward to working with them to promote PEEC's mission of environmental education.

Stephanie Kollar is a retired elementary teacher and assistant principal from the New York City Board of Education. She is also a member of the Milford Valley Quilt Guild and a regular attendee of PEEC's Quilting Workshops. Stephanie stated, "As a frequent participant in PEEC workshops I have an interest in seeing them continue. I'd also like to see improvements at PEEC continue to happen and help where I can."

Henry Skier is the President of AMSkier and AMSkier Reinsurance, the largest national insurer and reinsurer of children's camps in the United States. Since his days as a camp counselor at Camp With-A-Wind in Pennsylvania, Henry has committed much of his professional life to serving his community and children's camps. Henry stated that PEEC has a "mission I believe in and am eager to share."

13th Annual Golf Outing Thanks

Thanks to everyone who supported PEEC's 13th Annual Golf Outing…a day we will all remember!

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Special thanks to Jennifer Meng and the wonderful staff at the Lords Valley Country Club and the 46 hearty souls who went out there and played all 18 holes!!

A Week of Learning at the First Sci-Q Project

By Ian Kelmartin

"What time are we waking up for the early morning hike?" one of the campers chirped excitedly. It wasn't the question that caught me off guard, but the tone. "We'll talk about it once everyone gets back to the cabin," I replied, buying some time to craft my response. I had secretly hoped that the scheduled morning hike would slip through the cracks; the campers had been going hard for two and a half days. Perhaps in the interest of gaining an extra hour of sleep, no one would even mention it. My co-counselor Mary Beth and I, who were the first awake and last asleep each day, certainly would not have pushed the issue.

As the students assembled for our nightly meeting, Mary Beth and I discussed the matter and decided the hike would be optional, allowing the more sleep-deprived campers a chance to catch up. "Anyone who wants to come can meet me on the porch at 6:40, and we'll roll at 6:45," I told them, and asked for a show of hands from those who wanted to join me. A majority of the 19 raised their hands, but, since early morning plans often sound better the night before, I suspected only a handful would have the motivation to roll groggily out of their warm beds the next day.

I walked out onto the porch of our lodge at 6:35, greeted by a cool and rainy morning, the kind perfect for sleeping. So far only one intrepid student was out there. "I think Brian and Erik are on their way," he told me as one of the girls stumbled out from the other side. It was about the turnout I expected. But as we prepared to leave, campers appeared one by one, each promising another was almost ready. By 6:45, 15 slightly groggy but enthusiastic hikers were ready to set off into the woods—nothing short of a miraculous level of participation. The rain held off as we walked PEEC's Two Ponds Trail, and at breakfast an hour later, the students chattered briskly about all they had seen during our beautiful, misty morning hike.

This August, PEEC hosted The Sci-Q project, a week-long science camp for gifted high school students. The goal of the program was to get the students out of the classroom and into the field and lab, giving them hands-on experience in a variety of scientific disciplines. Each lesson was taught by an expert, including college professors and working scientists, so that the students received the best instruction and also the opportunity to interact with scientists and other professionals of varied backgrounds.

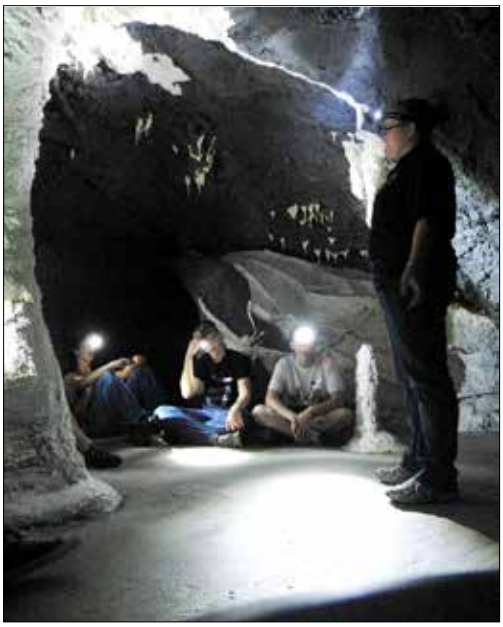
Sci-Q campers outside the Sterling Hill Zinc Mine in Ogdensburg, NJ. The campers are pictured with PEEC CEO Jeff Rosalsky (2nd from left), Instructor Mary Beth Nied (left), and Instructor Ian Kelmartin (right). The campers were treated to a tour of the mine, which is world-famous for the number of fluorescing minerals found within.

On the first day, the students searched for fossils in a quarry (finding several excellent specimens), learned how to orienteer using the same course and equipment as participants in the North American Orienteering Championships hosted at PEEC last year, learned about the physics behind canoeing, discussed energy production with author Seamus McGraw (his book *The End of Country* describes his family's experience with the natural gas industry in Northeastern Pennsylvania), and enjoyed making s'mores around the campfire. The rest of the week maintained the same rapid pace as the students took field trips to the Milford Experimental Forest (to collect data in an ongoing American Chestnut reforestation study), the Sterling Hill Mining Museum, and East Stroudsburg University's Planetarium. They conducted experiments in embryology, wildlife biology, genetics, and chemistry; participated in two Engineering competitions, and even made cheese!

Each of the activities could have an article devoted to it, and there were many high points throughout the week. For me, the absolute height was that misty morning hike. It demonstrated the exceptional enthusiasm and drive of the students, traits they maintained without fail the entire week. This was the first year PEEC offered the Sci-Q camp, and from my perspective it was an unqualified success. I had the privilege to watch the campers grow together as a team and as friends as the week progressed, and I saw the sparking of interests that may grow into careers, hobbies, and passions. On Friday, we asked each camper what they liked best and least about the program; the most common comment was that they wished the camp was longer. I hope that next year we will be able to build on the success of this year's program, and that PEEC is able to offer The Sci-Q Project each summer to come. Sci-Q campers were selected through a competitive application process. Selected campers were asked to pay a nominal fee to secure their spot, with the balance of their tuition, room, and board funded by a generous grant from the Anne Spychala Family Charitable Foundation.

Camper Erik injects a sea urchin with potassium iodide to induce spawning. After inducing spawning, students observed fertilization and initial embryological development under a microscope. Dr. Jennifer White of East Stroudsburg University facilitated the experiment.

Sci-Q camper Elizabeth measures the root collar diameter of an American chestnut sapling in the Milford Experimental Forest under the guidance of Dr. Leila Pinchot, a research fellow at the Pinchot Institute for Conservation. The campers collected data in a study designed to determine the best way to plant American chestnut trees.



PEEC instructor Mary Beth Nied gives the Sci-Q campers a tour of the Bat Cave in PEEC's Eco-Zone.

National Squirrel Awareness Month

By Jessica Snyder

Now…I'm not usually one for zany celebrations, but I just recently learned that October is National Squirrel Awareness Month. Some people love these energetic acrobats and others seem to loathe them. Whether you are friend or foe…no one can deny the importance they play in the ecosystem and the maintenance of forests.

Our local forests are home to 3 different species of squirrel; the common gray squirrel, American red squirrel, and Northern flying squirrel. Each of these squirrels has its own strategy for searching and storing food and each plays its part in helping the forest. The behaviors of the gray squirrel are among the most important.

Squirrels by nature are great problem solvers and most are able to easily adapt to human encroachment and, in fact, seem to flourish in urban environments. Many are able to quickly crack the newest of "squirrel proof" bird feeders… but where this ingenuity really stands out is in the forest. Gray squirrels are great survivalists and even plan ahead for when winter strikes. Gray squirrels tirelessly search for acorns, hickory nuts, and walnuts among other nuts and store what they don't need in the ground. They scatter their treasures across the forest floor, digging shallow holes and scent marking each nut for easy rediscovery later. This strategy is smart…except if you don't remember where you placed each nut. The buried nuts that are forgotten are primed for the spring weather and many will germinate and grow into young trees, further continuing the regrowth of young trees in the forest.

Squirrels also play other important roles in the forest. Throughout the year, squirrels take refuge in nests that they build and in holes found in trees. These holes are easily modified by the squirrels using their chisel like teeth to widen and deepen the hole. Other wildlife will often use these abandoned tree cavities as their own shelter. The Eastern screech owl is one example of an animal that benefits from these tree cavities. The screech owl is a bird of prey that nests in tree cavities and often uses tree cavities that the squirrels help make to raise their young. Squirrels are also important prey items for large birds of prey such as the red-tailed hawk and great horned owl.

Whether you are friend or foe…in the spirit of National Squirrel Awareness Month take a brief moment in October to honor the humble squirrel and recognize its unique abilities and the importance it plays in the ecosystem.

COMPOST

By Sheri Bone

It's almost like Magic. It's like Black Gold for Gardeners. It's compost!

If you aren't already saving kitchen scraps, grass clippings, and dead leaves to make compost, you may want to begin, especially if you have any plans for having a garden. Compost is a wonderful additive to any garden.

Compost is organic matter that has decomposed; it is used as a fertilizer and/or soil amendment. Organic matter is matter that has come from the remains of once-living organisms such as plants, animals, and their waste products. When allowed to decompose (break down into its original components) and then used for gardening and farming, these products add great nutrient value to the soil.

All soil is benefitted due to the nutrients that compost holds. If you have sandy soil, compost adds the structure that aids in water retention. Clayey soil is helped because compost adds components which allow water to be absorbed and it also supplies air spaces. Compost makes any kind of soil more fertile.

The main parts of a compost heap are moisture, oxygen, and organic materials. Kitchen scraps (potato skins, egg shells, banana peels, tea bags, lettuce leaves, etc.), grass clippings, old leaves, manure, and soil are great sources of organic materials for a compost heap. The "Decomposition Team" (bacteria, fungi, worms, insects, and microscopic organisms that perform the decomposition process) need oxygen and water to live and work. The moisture needs to be in correct amounts so that there is enough water for the decomposition activity to be maintained, but not too much so that anaerobic conditions are reached. If anaerobic conditions exist (anaerobic means "without oxygen") the result is a slimy, smelly mess.

The organic materials need to be a balance of materials that supply nitrogen and carbon. Think of the ingredients in terms of color and you will be aided in creating a good balance. "Green" materials (like grass clippings and other colorful items from the kitchen scrap pile) tend to be high in nitrogen. Nitrogen is needed for the organisms in the compost pile to grow, reproduce, and oxidize the carbon.

In this homemade compost bin system, there are 3 sections to hold the different stages of compost as it nears completion.

Carbon materials are thought of as "brown" (dead leaves, shredded newspapers) and tend to be dry and less colorful. They are needed for energy. The oxidation of carbon produces heat. The right amount of heat is needed to keep the "Decomposition Team" alive and kill weed seeds. The presence of the dry, carbon-filled ingredients helps keep the compost heap in an aerobic state (using oxygen and not becoming that smelly mess that was mentioned earlier!) Avoid using meat, fat, or dairy products in the compost pile. While they do decompose, they usually attract unwanted animals and their decomposition rates differ from plant-based materials. I also keep sticks out of my compost pile as they take a long time to break down.

Compost piles can be free-standing or they can be held in certain containers or structures. Many companies offer, at varying prices, compost bins that come in all shapes and sizes. They usually have covers to help keep heat in and animals out and holes for air to flow through. Many people build their own by using old pallets, concrete blocks, wire, or fencing to create the perimeter. A good compost pile will measure about 3' x 3' x 3'.

Decomposition is a process that occurs naturally. Dead leaves, logs, grasses, and other organic materials are constantly decomposing and becoming soil components. When Mother Nature does all of the work, the decomposition process can take up to three years to reach completion.

When people take time to gather the ingredients and help with the process by turning the components in the compost pile, the process is speeds up. Finished compost can take about three months to complete when people assist with the process. It is your choice to be a lazy composter (as I tend to be!) and let Mother Nature do most of the work or if you take a proactive role in its development.

If you have time and energy to turn your compost pile, you should have three sections associated with your compost bin system. When the first bin is full, use a shovel or pitch fork to put those materials into the second bin. This process allows more air to get into the ingredients, and, frequently, this process allows the materials to be broken down into smaller pieces. (The more surface area there is to the parts, the faster the decomposition.) Then fill the first bin with new composting material. When that first bin is filled again (or about a month later), move the materials from the second bin to the third bin, move the materials from the first bin into the second bin, and begin to add new material to the first bin. When it's time to move the materials once more, the compost in the final bin should be ready to use in the garden.

If you choose not be turn the compost, begin a new pile every season (or when you have reached a 3'x3'x3' sized mound) and after about 3 years the first pile should be ready. Compost that is ready to use as an additive to the garden soil is dark brown or even black. There is usually a pleasant, earthy smell to it and, except for an occasional egg shell, you should not be able to discern the materials that were used in the process.

To use compost, till or hoe it into the soil where you will be planting. Sprinkle some around plants. Not only are you making your existing garden soil more fertile, being a conscious composter is one way to "reduce, reuse and recycle" some of the organic waste that is produced in your kitchen and found around the yard. It's one more good way to take care of the earth.

Split Stream Property Donated to PEEC

Martha E. Wicks donated 1.9 acres of land to PEEC in memory of her husband Thad W. Wicks.

The property is on Sunset Lake Road, about one mile from PEEC and close to the Old School House (PEEC staff housing).

The land is wooded with a combination of deciduous and evergreen trees and has a beautiful stream running through it. One side of the property adjoins the Girl Scout Camp Hidden Falls.

Martha Wicks, whose family founded Quiet Valley Historical Farm in Stroudsburg, had owned the property for 38 years, but now lives on Cape Cod. She decided she wanted to donate the land to an environmental organization in memory of her late husband Thad W. Wicks. Given PEEC's proximity to the property and our environmental education mission, we were the logical choice.

Split Steam with be used for a variety of environmental programs which we offer, including: geology, water quality study, and macro-invertebrate study and will allow us to offer addition programs focused on managed forestry and native American studies, as well as recreational activities.

WATER WATER EVERYWHERE...

By Mariann Oswald

So, you think you know your water. Dasani, Nestle, Deer Park? Yes, 70% of the Earth's surface is covered in water. But water also exists in the air, in the ground and, yes, in you. That's a good thing, since 96% of the water is salt water. So, there you have it. Only 4% of all of the water on Earth is not salt water!

See how much you know. Match the term with its definition. (Definitions are from http://iaspub.epa.gov/sor_internet/registry/) Good luck.

1. **Bog**
2. **Community**
3. **Estuary**
4. **Fen**
5. **Habitat**
6. **Marsh**
7. **Mesotrophic**
8. **Potable**
9. **Precipitation**
10. **Reservoir**
11. **Swamp**
12. **Transpiration**
13. **Tundra**
14. **Watershed**
15. **Wetlands**

	A type of wetland that accumulates peat deposits deriving most of their water from groundwater rich in calcium and magnesium
	A type of treeless ecosystem dominated by lichens, mosses, grasses, and woody plants. Tundra is found at high latitudes (arctic tundra) and high altitudes (alpine tundra). Arctic tundra is underlain by permafrost and is usually water saturated
	The process by which atmospheric moisture falls onto a land or water surface as rain, snow,
	A type of wetland dominated by woody vegetation but without appreciable peat deposits, may be fresh or salt water and tidal or non-tidal
	The process by which water vapor is released to the atmosphere by living plants
	A topographic area within a line drawn connecting the highest points uphill of a drinking water intake into which overland flow drains.
	Any natural or artificial holding area used to store, regulate, or control water
	a bay or inlet, often at the mouth of a river, in which large quantities of freshwater and seawater mix together
	Water that is unsafe or unpalatable to drink because it contains pollutants, contaminants, minerals, or infective agents
	The place where a population (e.g. human, animal, plant, microorganism) lives and its surroundings, both living and non-living
	Reservoirs and lakes which contain moderate quantities of nutrients and are moderately productive in terms of aquatic animal and plant life
	Found almost exclusively in glaciated depressions, soils are saturated highly acidic, have low nutrient levels, and are saturated throughout the growing season
	A type of wetland that does not accumulate appreciable peat deposits and is dominated by herbaceous vegetation. Marshes may be either fresh or saltwater, tidal or non-tidal.
	An area that is saturated by surface or ground water with vegetation adapted for life under those soil conditions
	an assemblage of populations of different species within a specified location in space and time

Wow. If the unsalted 4% is in all of these places... I think I'll use water more wisely. How about you? Check out http://wateruseitwisely.com/100-ways-to-conserve/index.php.

ANSWERS: 4, 13, 9, 11, 12, 14, 10, 3, 8, 5, 7, 1, 6, 15, 2

Enzyme Activity in Freshwater Aquatic Ecosystems

Faculty:

Dr. Andrew Steen, University of Tennessee
Patrick Murray, Malcolm X. Shabazz High School

Project Description:

Malcolm X Shabazz High School (MXS) high school students collaborated with researchers, Dr. Karen Lloyd and Dr. Andrew Steen, at the University of Tennessee (UT) department of Microbiology to conduct an enzyme field research project at the Pocono Environmental Education Center (PEEC). The field research project at PEEC was funded by a grant from the Foundation for Newark's Future.

The student research focused on understanding how bacteria acquire food by measuring protein-egrading enzymes. The enzymes measured have never previously been measured in freshwater. These enzymes are a key intermediate in the conversion of plant material into carbon dioxide (CO_2) and therefore serve as a control on the rate of global warming.

Accomplishments:

Students collected Delaware River Watershed water samples from seven distinct sources within 5 miles of PEEC, including both ground water and sub-surface water. Student combined samples with reagents to test for the presence of five distinct enzymes. Samples were then examined in the spectrophotometer to measure enzyme concentrations. Several enzymes never previously measured in freshwater were recorded and considerable variation in enzyme concentration was recorded in different tested water sources.

PEEC's Eagle Scout Instructors

By Allison Owczarczak

This year PEEC has three Eagle Scouts amongst the Instructors and we decided to ask them a few questions about their experience:

Any advice for boys pursuing the Eagle rank?

Ryan Gerbehy
Taking before and after pictures helps. Don't try to take everything on yourself. The project is meant to show how you can manage a group, not how much you can do personally.

Ian Kelmartin
Take advantage of all the opportunities scouting provides. Step up and volunteer for a leadership position; it will give you skills that most people don't develop until well into their 20's. It's a challenging endeavor; you'll end up frustrated more than a few times. Learning how to persevere despite frustrations is one of the most important parts of becoming an Eagle. It's a huge undertaking, and anyone familiar with the program knows that. Ask for help and guidance when you need it. It's all going to seem overwhelming at first, but take everything one step at a time and you will achieve something you'll be proud of for the rest of your life.

Will Rode
My advice would be to stick with it. It's a hard journey, but once you get past it it's a very rewarding feeling. When you are going to your review board for review be honest and truthful, be confident in your answers. My final word of advice is be flexible during the process and be prepared to make changes to your project and do rewrites.

How do you feel earning the Eagle rank has prepared you for life and the workforce?

Ryan Gerbehy
The entirety of my BSA experience was helpful in giving me social skills, leadership ability, and helping me learn to compromise. My career path has taken me pretty far from the construction/landscaping direction that my project took. But I would say that I learned a few handy group management skills.

Ian Kelmartin
I'm a shy person by nature, but in the senior leadership corps of a troop of 50 boys, I was forced to come out of my shell. As Senior Patrol Leader (the elected youth leader of the troop), I had to stand in front of the troop to present the program for weekly meetings, lead trip planning, and help solve conflicts among the troop members. The year I spent as SPL is probably the most valuable experience I've had; I learned a tremendous amount about what it takes to be an effective leader and it laid the foundation for me to further develop my leadership skills.

Perhaps the biggest way the experience prepared me for life was learning that it's impossible to do everything by myself; while it's important to lead by example and be willing to do every task you might ask someone to complete, effective delegation is the cornerstone of effective leadership.

Will Rode
It has prepared me by giving me confidence that I didn't have and doing the merit badges has helped me focus on what I want to do in life; by doing those badges it gave me a look into those fields and what I wanted to pursue further.

How to Hand Whistle

By Laura DeWolff

As a teenager, I forgot something in the car on an Adirondack vacation with my parents. We were on a path I should have known well, so my dad told me to meet them down at the river. I dashed back to the car, got my things, and started back down the path. Then the path split, but I wasn't sure which way to go. I had forgotten. I yelled, "Dad?" but my voice is always quieter than I want it to be. So I brought my hands to my lips and fluted out the beginning notes to the theme of "The Good, the Bad, and the Ugly". Moments later I heard a responding trill. I took the right hand path and joined my family at the Hudson.

I spent an entire summer practicing how to hand whistle when I was a kid. At first the way I held my hands felt awkward, and for a long time all I could produce was a sad, howling wind sound. Not to mention the light headed feeling I would get from trying too hard. Eventually I got the hang of it. First I was able to sustain a note and then I was able to move on to different notes and even start playing songs.

There are a few different ways you can hold your hands, but I'll start with a basic one. Cup your right hand and place your right thumb on the length of your pointer finger, just below your knuckle. Cup your left hand, and wrap it around the right. Place your left thumb next to the right one. The tips of your thumbs should touch each other, but there should be an opening below that, which I'll call the tone hole. By holding your hands this way, there should be a "cave" inside your hands.

Next place your lips on the knuckles of your thumbs and blow. This is the tricky part. All too often people will blow air straight into the cave formed by your hands. Try instead to get the airflow to go into the tone hole at an angle. This works the same way as a real flute and the same way as blowing air across the top of a glass bottle. The air inside your hands will vibrate and produce a sound.

Once you've been able to consistently make a sound, you can try making different notes. The way to do this is by changing the shape and size of the cave. I do this by lifting the fingers on my left hand to collapse the cave and produce a higher note.

An alternative method is to interlace your fingers, and proceed that way. This tends to produce higher notes, and control of the sound comes from how much you cup your hands.

AUTUMN 2013 PROGRAMS AND GETAWAYS

PRE-REGISTRATION REQUIRED
Unless otherwise indicated.

TO REGISTER:
Call PEEC at 570-828-2319
with credit card information available
Or download application: www.peec.org/pdfs/PEECProgramRegistration.pdf

OCTOBER

Fall Photography w/ Del Morgan
October 4-6
$195 / $150 commuter rate
Join Del Morgan, a fine art photographer who draws his artistic passion from nature. What is here for you to discover? Join this wonderful new weekend program and learn how to create visually stunning images.

Birds of Prey Migration
Saturday, October 5 – 9:00am-4:00pm
Cost: $15
The hawks, eagles and falcons are migrating! Join us for a day of raptor watching at Sunrise Mountain. Dress in warm layers and bring a folding chair, binoculars, water and snacks. Space limited – call to reserve a spot in the van.

EcoZone! Afternoon
Saturday, October 5 – 1:00-4:00pm
Cost: $5
Explore our new hands-on, discovery room. Crawl through the bat cave, sit in the eagles' nest, and more!

PEEC TWEETS
Follow us on Twitter:
@peec_tweet

"Falling Leaves" Family Nature Getaway Weekend
Columbus Day Weekend: October 11-14
Adults $210 / Child, Commuter, Day Rates
Bring your friends and family to experience the best of what PEEC has to offer. Interpretive hikes, animal presentations, square dance, canoeing, tie-dye, campfire and more! Includes 3 nights lodging & meals from Friday dinner - Monday lunch.

Fall Photography w/ John Barclay
Weekend or week-long option!
October 13-18 – $750 / $700 commuter
October 18-20 – $290 / $240 commuter
Capture the beautiful fall colors with world renowned photographer, John Barclay. Learn about exposure, composition and more. Geared towards DSLR type cameras. A tripod is recommended, but not required. Includes lodging and meals. Don't miss this wonderful opportunity – capture the beauty of autumn under the guidance of an amazing teacher!

Fall Foliage – Hikers Paradise
Saturday, October 19 – 1:00-3:00pm
Free for members / $5 for non-members
Enjoy the autumn colors with a leisurely walk in the woods. Wear sturdy footwear, dress in warm layers, and bring a camera!

Nature at Night
Saturday, October 19 – 6:00-8:00pm
Cost: $5
A cool fall evening is the perfect time to head outside. Take a walk in the woods to listen for owls, look at stars, and enjoy the music of the night. Enjoy fun activities that test your night vision.

The "Easy Does It" Hikers
Sunday, October 20 – 10:00am-12:00pm
Cost: Free
Enjoy a nice leisurely walk through the woods. Join us for easy hikes, slow paces and interpretive natural history.

EcoZone! Afternoon
Sunday, October 20 – 1:00-4:00pm
Cost: Free
Explore our new hands-on, discovery room. Crawl through the bat cave, sit in the eagles' nest, and more!

ECO book club – "Desert Solitaire," by Edward Abbey
Sunday, October 20 – 1:00-2:30pm
Cost: Free
Read a new book! Meet up to discuss the book and share thoughts. Bring some snacks and enjoy a delightful afternoon. Edward Abbey's "Desert Solitaire" depicts his entrancement with the deserts of the American Southwest. He describes how the desert affects society and more specifically the individual on a multifaceted, sensory level.

Girl Scout Badge Fest
Saturday, October 26 – 9:00am-4:00pm
$12 half day / $20 full day
Attention all Girl Scouts! Come to PEEC for a fun day of badge work. Earn badges while working outside in the beautiful Pocono Mountains. Payment is required at registration. Space is limited - call early!

NOVEMBER

Boy Scout Badge Fest
Saturday, November 2 – 9:00am-4:00pm
$12 half day / $20 full day
Attention all Bears, Webelos and Boy Scouts! Come to PEEC for a fun day of badge work. Call for details on specific badges. Payment is required at registration. Space is limited - call early!

Volunteer Appreciation Dinner
Sunday, November 3 – 5:00-7:00pm
Cost: Free
To show our appreciation for all they do, PEEC's volunteers are invited to a special dinner.
5:00pm Ecozone Tour / 6:00pm Dinner

EcoZone! Afternoon
Sunday, November 3 – 1:00-4:00pm
Cost: Free
Explore our new hands-on, discovery room. Crawl through the bat cave, sit in the eagles' nest, and more!

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AUTUMN PROGRAMS AND GETAWAYS

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NOVEMBER cont.

Flying Needles Quilt Camp
November 7-10
$250 / $200 commuter
All Unfinished Objects and fiber arts are welcome! Join Patti Shreiner for a relaxing weekend in the beautiful Pocono Mountains. Beginners are always encouraged to join. Focus project: all fiber arts. Includes 3 nights of lodging and 9 meals.

Holiday Bows and Boughs
Sunday, November 10 – 1:00-3:00pm
Cost: $12
Create your own holiday decorations using natural materials! We provide evergreen boughs and materials for you to make wreaths. You can also bring your own supplies and decorations. Pre-registration required.

EcoZone! Afternoon
Sunday, November 10 – 1:00-4:00pm
Cost: Free
Explore our new hands-on, discovery room. Crawl through the bat cave, sit in the eagles' nest, and more!

SPORTSMAN SERIES:
White tailed deer from A to Z
Sunday, November 10 – 11:00am-3:00pm
Cost: $20
What do our chef, biologist and hunter all have in common? Their love of the white tailed deer. Learn all about the *Odocoileus Virginianus* that are so prevalent in our area, from the different perspectives of our visiting speakers. Lunch included!

Game Dinner
Saturday, November 16 – 7:00-9:00pm
Cost: $35 / $60 couple
Enjoy the bounty of the season at PEEC's annual game dinner! This dinner features Pennsylvania game and seasonal harvests, cooked to perfection. Bring your friends and family to enjoy this cozy evening.

EcoZone! Afternoon
Saturday, November 16 – 1:00-4:00pm
Cost: $5/person
Explore our new hands-on, discovery room. Crawl through the bat cave, sit in the eagles' nest, and more!

Introduction to Astronomy
Saturday, November 23 – 7:00-9:00pm
$10 / adults only, please
Step out for an evening of star gazing and learn about some of the constellations in the sky. Pre-registration required.

DECEMBER

Lenape of the Eastern Woodlands
Saturday, December 7 – 1:00-3:00pm
Cost: $20
Mike Dennis of Traditional Earth Skills will teach you about the day-to-day activities of the Lenape culture. The food, clothing and shelter of the local hunter gatherers will be presented, along with handmade artifacts. Ages 10+ please.

EcoZone! Afternoon
Saturday, December 7 – 1:00-4:00pm
Cost: $5/person
Explore our new hands-on, discovery room. Crawl through the bat cave, sit in the eagles' nest, and more!

Introduction to Astronomy
Saturday, December 7 – 6:00-7:30pm
Cost: $10
Step out for an evening of star gazing and learn about some of the constellations in the sky. Pre-registration required.

Introduction to Snowshoeing
Sunday, December 8 – 9:00-11:00am
Cost: $10
Learn the basics of using snow shoes. No experience necessary – we provide the equipment and teach you everything you need to know. Register early to guarantee a spot!

EcoZone! Afternoon
Sunday, December 8 – 1:00-4:00pm
Cost: Free
Explore our new hands-on, discovery room. Crawl through the bat cave, sit in the eagles' nest, and more!

Winter Survival Hike
Saturday, December 14 – 1:00-3:00pm
Cost: $20
Join Mike Dennis of Traditional Earth Skills for a fun afternoon in the fields and forests. Build a shelter, try your hand at fire making, and learn other useful skills for the wintertime.
Adults only, please.

Around the Campfire
Saturday, December 14 – 4:30-6:00pm
Cost: $5
Enjoy a leisurely dusk hike that ends at the campfire ring. S'mores provided. Bring your favorite campfire song!

Hibernation Hike
Sunday, December 15 – 10:00am-12:00pm
Free for members / $5 for non-members
Learn how different plants and animals survive the winter. Join us on a hike and experience PEEC in the wintertime.