

COVE CURRENTS

Greetings from the Executive Director

This particular afternoon at Palmyra Cove is cold, grey, and windy; it is a perfect afternoon to reflect upon the past and to bring into focus the big picture for Palmyra Cove as we plan for 2015.

This year our education staff, Kristina Merola, John Moore, and Peter Dorofy will design a research project, with specific protocols, that will revolve around weather and plant succession. Each of these three has been accepted by GLOBE (Global Learning through Observation to Benefit the Environment) as international scientists and identified as such on GLOBE's international database. Their project will be designed in such a way that teachers and students, both local and international, can add observational data to GLOBE's database. This data can then be accessed by students and scientists around the world. Such a project provides Palmyra Cove with an opportunity to offer both environmental science field work and remote sensing satellite image analysis within a single educational program.

Our mission has been, and continues to be, to bring the knowledge and experience of science to the most diversified audience possible, children, adults, girls, boys, teachers, and students. The resources at hand to accomplish this ambitious task are considerable: a 250-acre wildlife preserve with wetlands, woodlands, a one-mile river shoreline, and a protected tidal cove; an Environmental Discovery Center with an exhibit hall, a classroom, a computer lab, a flora and fauna database, two Falcon Cam monitors, a 50-inch ultra-high-definition display for tracking satellite and remote sensing data; the Burlington County College mobile science lab; a WeatherBug weather-prediction system which includes a Lightning Detection and Early Warning System, thanks to a generous dona-

tion by Palmyra Cove Environmental Education Foundation members Sue Bye and Wendy M. Haniman; and a working relationship with Burlington County College, Rowan University, and Drexel University.

I remember my third grade teacher saying, "When you learn a new word, you will see it everywhere." I have thought about that comment many times over the years, recently while reading a Commentary in the Philadelphia Inquirer on February, 25, 2015, by Eunice Heath, Global Director for Sustainable Products Marketing and Strategy for the Dow Chemical Company. Another Commentary was also in the Philadelphia Inquirer, on March 9, 2015, by Mariandl M.C. Hufford, Director of Academic Affairs and the Center for Advancement of Girls at the Agnes Irwin School. Both women discussed the importance of attracting girls into the sciences and ultimately into STEM (Science, Technology, Engineering, and Math) careers. Over the past few years, this subject is one that I have seen written about often in a variety of publications and it is one that we discuss frequently at PCNP. Ms. Heath states in her commentary that we need to do more to "...provide students with hands-on, project based opportunities in STEM subjects and help them develop critical skills as early as kindergarten and all the way through high school." The ripple effect is obvious. Women who become STEM career professionals ultimately become mentors for girls in these careers. Ms. Heath points out that only 14% of all professional engineers are women, not enough to provide the role models needed to encourage girls to choose engineering or other science-related careers.

Ms. Hufford makes many of the same observations in her commentary with an additional point being the importance of



Male Dix Moth

proper “...curriculum design and the preparation of teachers at all levels of the educational pipeline. We know that teachers are the number-one factor in encouraging the persistence of girls in STEM subjects.”

The evolution of science education at Palmyra Cove reflects trends in science and the trends in science education at the national level. Consequently, our programs are designed not only to meet the requirements of the Next Generation Science Standards but also to meet the needs of the 21st Century workforce. Teachers, of course,

are the critical component in the success of both. Our professional development teacher workshops offered throughout the year by John Moore help to bring STEM related programs into the classroom.

We are putting the pieces together to make Palmyra Cove a regional destination for environmental science and Geoscience/STEM education for teachers and students throughout the tri-state area. Visit often; we'll be looking for you.

Clara Ruvolo, Executive Director



In Praise of Snowshoes

As I sit at my computer writing this article, the snow is falling. Part of me doesn't like it. I don't look forward to shoveling the sidewalk and digging the cars out. But part of me is really excited and hoping for lots of snow, because even though I'm in my sixties, I still like to play in the snow. The thing I like to do most in the snow is hiking on my snowshoes.

I consider snowshoes to be one of man's great inventions. I love to go out in the woods and snowshoes allow me to go out even when the snow is piled deep. While others are suffering from cabin fever, I'm out enjoying the great outdoors.

The reason I like snowshoeing so much is that it's very easy to do. Unlike cross country skiing, snowshoeing has no learning curve. You just strap them on and start walking. There are some techniques for turning but they are intuitive and you can figure it out for yourself.

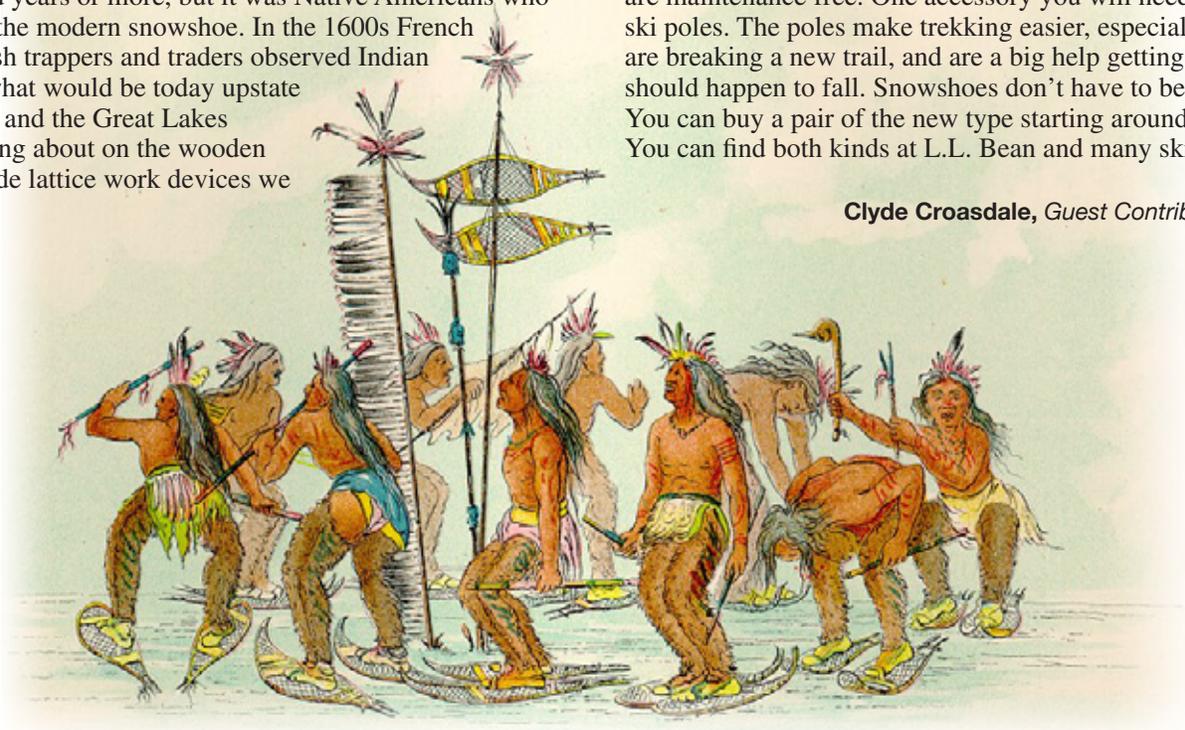
Snowshoes in one form or another have been around for a thousand years or more, but it was Native Americans who perfected the modern snowshoe. In the 1600s French and English trappers and traders observed Indian tribes in what would be today upstate New York and the Great Lakes region going about on the wooden and rawhide lattice work devices we

know as snowshoes. The tribes considered their snowshoes so important that they held ceremonies to welcome the first snow because they felt that the snowshoes gave them an advantage over their prey when hunting in winter. The painter and explorer, George Catlin, observed one of their ceremonies in the 1840s and recorded it in a painting.

These snowshoes were vastly superior to anything the Europeans had. The newcomers quickly adopted the native's contrivances. Any voyageur traveling in the North Country in winter made sure he had his snowshoes. Snowshoes were employed by both sides in the French and Indian War and several battles were fought on snowshoes.

Today, we have a choice in snowshoes. The old fashioned wooden snowshoes are still being made and some, like myself, prefer them. Then there are modern aluminum and neoprene contraptions. Both styles work well. It is strictly a matter of personal preference. Wooden shoes are quieter but require some very minimal maintenance. Aluminum shoes are maintenance free. One accessory you will need are some ski poles. The poles make trekking easier, especially if you are breaking a new trail, and are a big help getting up if you should happen to fall. Snowshoes don't have to be expensive. You can buy a pair of the new type starting around \$125.00. You can find both kinds at L.L. Bean and many ski shops.

Clyde Croasdale, Guest Contributor



Traditional Ojibwa Snowshoe dance

Jewels of the Night

Boy, I'll tell you after the winter we have had, I long for a warm and humid summer night to set up the light and sheet! I look forward to inviting the winged beauties back from their many months of rest or metamorphosing and to exploring the unknown world of the night with those colorful creatures that are foreign to many but "jewels of the night" to me.

Let's see, Mothing.... Moth watching.... Hmmm, Moth-er.... Moth watcher.... Lepidopterist.... Ok. Not sure what to call us or how to describe what we do, but it involves studying some of the least understood jewels of the nighttime world.... MOTHS. The order "Lepidoptera" includes both moths and butterflies. The word Lepidoptera comes from the Greek words "lepidō" for scale, and "ptera" for wings and refers to the flattened hairs or scales that cover their body and wings. Compared to butterflies, moths have feathery antennae lacking the balls or clubs at the ends. They have scales that almost look like hair, primarily fold or tent their wings over their abdomens when at rest and mainly fly at night. There are close to 175,000 species of Lepidoptera, 90% of which are moths. Approximately 12,000 of the species are found in North America of which about 11,300 are moths.

What do you think of when you hear the word MOTH? A small drab flying insect at your porch light? Do you envision them flying from your bedroom dresser drawer that houses your winter sweaters? That is what I hear the most but let me tell you, when you start to look closer you will be amazed! Oh the colors and shapes and sizes! Most moths are "nocturnal" active at night, but some can be found during the day drinking nectar from sweet summer flowers. Many do not eat at all, as they are born without mouth parts; their sole purpose in life to reproduce and continue the species.

But why would something live just to reproduce and then die? One of the many stages of the moths' life cycle can benefit many others. Moths are important pollinators of plants, their hairy bodies carrying pollen from flower to flower. The caterpillar and the adult moth both are an important food source for many birds and bats to name a few. But also... get ready for this kids, they may be our next superfood!!! Many parts of the world already rely on moths and caterpillars as food, packed with protein and healthy fats! But I haven't

gotten to that stage of moth enjoyment yet... Yet.

Moths are among the most successful group of insects on the planet. They are found on every continent except for Antarctica. But something in such great numbers and so diverse is not without peril. Moths are soft bodied, fragile and almost defenseless while caterpillars move slowly or are immobile altogether. These characteristics leave them vulnerable to predation but they are not without defenses. Over millions of years they have developed many defensive strategies such as camouflage (if you can't see them you can't eat them), mimicry (if a moth looks like a wasp that may sting you many will leave it alone), and aposematism which in nature basically means something very colorful and flashy is not hiding but saying "you don't want to touch or eat me because I could be poisonous or at least be very bad tasting."

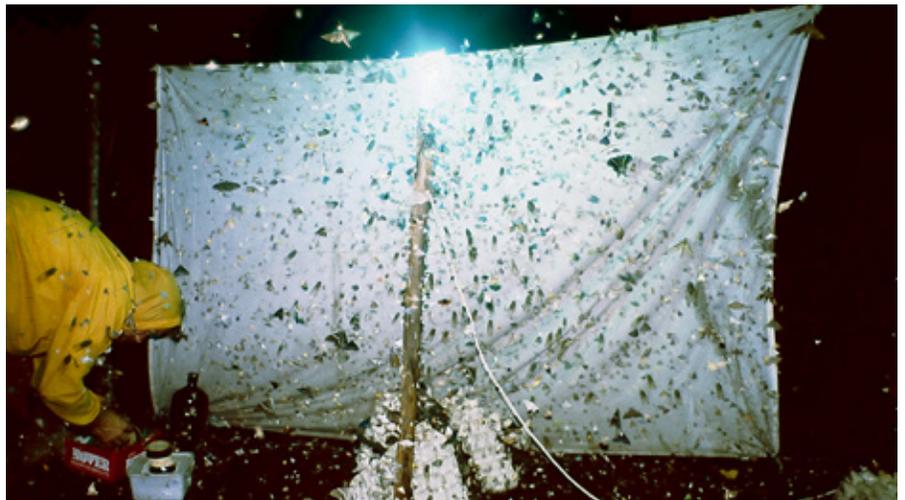
Moth-er.... What we do is attract and photograph moths, the more the better! If your 100-watt porch light attracts a few moths then what will attract a bunch of moths? A BIG light! We use large 1000-watt lights to attract moths from miles away and set up a big cotton sheet to give them a place to land and show off their beauty. We believe moths can see and are attracted by UV (ultraviolet) light. Some bulbs give off large amounts of UV light attracting a large variety of moths and the brighter the light the greater the distance they are drawn from. But anyone can start small. Hang a white cotton pillow case or sheet by your porch or patio light and leave it on into the dark and discover "The Jewels of the Night."

Watch the Palmyra Cove website for a planned Moth Night coming this summer and join us in discovering "The Jewels of the Night"!!

Bernie Knaupp, Guest Contributor



Cecropia Moth-David Britton
Licensed under CC BY-SA 2.0
via Wikimedia Commons - http://commons.wikimedia.org/wiki/File:Cecropia_moth.jpg
#/media/File:Cecropia_moth.jpg



Tony Harman at the moth sheet on Bukit Retak, Brunei in 1982-Accassidy

"Mothing on BukitRetakBrunei2" Licensed under CC BY 3.0
via Wikimedia Commons - http://commons.wikimedia.org/wiki/File:Mothing_on_BukitRetakBrunei2.jpg#/media/File:Mothing_on_BukitRetakBrunei2.jpg

Education Corner



Educational Activities: We have a wonderful program of hands on activities that have remained as teacher and student favorites throughout the years. In addition to these “classics,” we are now offering new Earth SySTEM (Science, Technology, Engineering, Math) activities to our visiting schools. These include topics in weather, climate, satellites, and remote sensing. We also have a number of GLOBE (www.globe.gov) study sites set up around the park, so if you are a teacher and would like to get your students involved in the GLOBE program, please feel free to contact us.

Spring Schedule: We are looking forward to our visiting school groups this spring. We currently have over 2500 students from 26 school districts scheduled to visit the park. We have a wonderful education staff and am I looking forward to working with them. With that in mind, we are currently looking for additional teachers so if you or someone you know is interested in joining the team, please drop me a line, pdorofy@bcbridges.org. Al Shinn has retired from seining; we thank him for all of his years of service, expertise, and bravery! Seining can be dangerous in the Delaware, especially when the waters are rough and unpredictable. We wish Al a wonderful retirement.

Around the Park: We hope you had a chance to visit the park this past winter and we look forward to your visit this spring. The weather is getting warmer and the days are getting longer. When you visit the park, please take care of yourself: Drink plenty of fluids, walk the marked trails only, observe all safety signs, and do not feed the wildlife. Again, we look forward to seeing you. Enjoy the park’s diverse wildlife and fauna this spring.

Peter Dorofy, *Director, Environmental Education*



Now for some ground breaking news! Under an agreement with Burlington County College we now have a Geoscience Remote Sensing mobile classroom that is currently being used in-house to facilitate some of the new activities. With this “STEM on wheels” we are in the process of exploring outreach opportunities to area schools, so stay tuned. In the meantime, come on over to the Cove and check it out.

Naturalist Notes

The snow in winter and the rain in spring have left us full of anticipation of this year’s aquatic reptile and amphibian life. All of the precipitation has led to a full Vernal Pool. Vernal pools are temporary shallow wetlands that dry up in the summer. Since they dry every year, aquatic predators, such as fish, turtles, and Bullfrog tadpoles, do not live in this kind of a wetland. Vernal pools become a safe haven for smaller amphibian species to lay their eggs in the spring. The species at Palmyra Cove that can be found in Vernal Pool are Fowler’s Toads, Gray Tree Frogs, and Spring Peepers. These species will lay their eggs in the vernal pool, the eggs will hatch, and the young will go through metamorphosis into their adult form all before the pool dries up in summer.

Bullfrog Pond, right next to our Vernal Pool, is also doing well with the increased precipitation. Bullfrog Pond is deeper

than Vernal Pool and does not dry completely in the summer. In this pond, we can also find Fowler’s Toad tadpoles, but they are not as safe as in the vernal pool because Bullfrog Pond is also home to various species of fish, Bullfrogs, Green Frogs, Painted Turtles, Red-bellied Turtles, and Red-eared Sliders. Herons visit Bullfrog Pond to look for food. If you look closely, you can also observe macro-invertebrates, small water insects that live in the water, including: dragonfly nymphs, water boatman, water striders, and backswimmers.

During Cove Campers summer camps, we will be exploring the many wetlands around the park, observing the differences between them, and comparing the animals that call each home.

Kristina Merola, *Naturalist*



Bullfrog Pond

GeoSTEM

Earth System Science, Technology, Engineering, Mathematics

Earth SySTEM ... it's all about Satellite Imagery, Remote Sensing, and Computer Visualizations.

The Institute for Earth Observations @ Palmyra Cove continues to introduce and conduct innovative Earth SySTEM projects from a local to national level. There is a lot going on! Highlights of programs and opportunities are outlined below.

“Bringing a Geoscience and Remote Sensing Mobile Lab to a school near you - GLOBE on the GO!”

The Institute for Earth Observations @ Palmyra Cove has become the program managers for the Burlington County College's NASA RV. The RV, or mobile classroom, was obtained through a NASA STEM Education grant awarded to BCC in 2009. The Geoscience Remote Sensing mobile classroom will allow us to introduce the topics such as satellites, remote sensing, and computer visualizations on location, and conduct GLOBE training, activities, and program development in schools. The mobile lab will also be used at the Cove in the expansion of our program activities currently offered as part of our Environmental Education Program.

“Burlington County College Earth SySTEM Courses – Building the Earth SySTEM Master Teacher Corps”

Two courses are once again being offered during the spring 2015 semester through the Office of Continuing Education at Burlington County College. Earth SySTEM I and II provide teachers with an introduction to Earth SySTEM resources and programs that can be easily implemented in their classrooms. Earth SySTEM II builds on a multi-year team of teachers who discuss and debate policy issues and practices that impact educational practices ranging from in their own classrooms, to national level policy. Two major policy issues that are often discussed are the Next Generation Science Standards (NGSS), and Science, Technology, Engineering, and Mathematics (STEM) Education.

“Global Precipitation Mission (GPM) Project and Blog – ground validation of satellite rainfall observations”

According to NASA, “the GPM mission will help advance our understanding of Earth's water and energy cycles, improve the forecasting of extreme events that cause natural disasters, and extend current capabilities of using satellite precipitation information to directly benefit society.” As part of the GPM Master Teacher Corps, teacher and friend of the Cove Vicky Gorman, 7th grade teacher of science at Medford Memorial School, is working with other Master Teachers from around the country in piloting new lessons and participating in a joint GPM-GLOBE Program ground validation project. Specifically here at the Cove, a number of rain gauges have been placed around the park representing different ecosystems or unique environments that may impact precipitation amounts. This can be thought of as a “Micro-Climate”

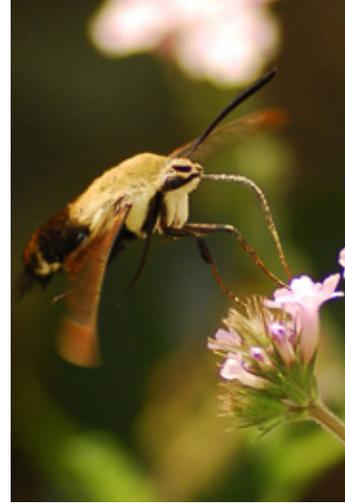
investigation. This is a highlighted study within the Master Teacher Network. Providing ground validation measurements help NASA scientists and engineers validate measurements taken from space that are used in the creation of computer visualizations or models. Interested in becoming a Citizen Scientist? Contact me to learn how, jmore@bcbridges.org.

“GLOBE Distinguished Educator Fellow - the introduction of GOES-R imagery and ground validation meteorological activities”

I am happy to announce that I have been selected as GLOBE's first “Distinguished Educator Fellow” for North America. I will be working with Geostationary Operational Environmental Satellite (GOES) project scientists and outreach coordinators, to add the GOES satellites to the list of GLOBE Satellite Partnerships. GOES imagery may be familiar to you as it is most used by broadcast meteorologists to depict clouds and weather patterns. In discussions about the topic of Climate Change, there are often questions concerning the difference between Climate and Weather. An explanation can be determined by answering two simple questions: (1) what type of clothes do you have in your closet? That will give an indication of the climate in which you live. (2) What did you chose to wear today? That's weather.

The project's objective is to build an international collaboration where students, teachers, and citizens can report and document local weather conditions and/or events. This will provide a foundation, or think of it as creating a record or database, that will aid in the documentation climate change. Comparing weather events to GOES satellite imagery is another example of ground validation, yet it will provide a venue for people around the world to share significant weather events and their impacts. As a National Oceanic and Atmospheric Administration (NOAA) Weather Ready Nation Ambassador, it is important for people and local communities to develop environmental resilience plans. This study will bring attention to the numerous weather challenges we face in our communities, and as a nation, on a regular basis. The GOES-R satellite is scheduled for launch in the spring of 2016. This work will be part of the planned Pre-Launch Educators Symposium at Kennedy Space Center in Florida.

John D. Moore, *Director for Geoscience STEM Education*



**Hummingbird Moth-
Andrea Westmoreland**
Licensed under CC BY-SA 2.0 via
Wikimedia Commons - http://commons.wikimedia.org/wiki/File:Hummingbird_Moth_another_view_-_Flickr_-_Andrea_Westmoreland.jpg#/media/File:Hummingbird_Moth_another_view_-_Flickr_-_Andrea_Westmoreland.jpg

Upcoming Events

Registration is required to participate in Palmyra Cove Nature Park programs. For more information, please see our website at www.palmyracove.org or contact Barbara Farnsworth at (856) 829-1900 x 1270 or bfarnsworth@bcbridges.org.

| | | | |
|-----------|------------------------|---------------------------------------|-----------|
| May 16 | 9:00 a.m. – 12:00 noon | Beginning Birding for Adults | Adult |
| May 25 | 9:00 a.m. – 4:00 p.m. | Environmental Discovery Center closed | |
| June 6 | 9:00 a.m. – 11:00 a.m. | Family Walk | All Ages |
| June 20 | 9:00 a.m. – 12:00 noon | Beginning Birding for Adults | Adult |
| July 3 | 9:00 a.m. – 4:00 p.m. | Environmental Discovery Center closed | |
| July 4 | 9:00 a.m. – 4:00 p.m. | Environmental Discovery Center closed | |
| July 4 | 9:00 a.m. – 11:00 a.m. | Family Walk | All Ages |
| July 6 | 9:00 a.m. – 1:00 p.m. | Cove Campers Summer Camp Week 1 | 1st – 8th |
| July 13 | 9:00 a.m. – 1:00 p.m. | Cove Campers Summer Camp Week 2 | 1st – 8th |
| July 18 | 9:00 a.m. – 12:00 noon | Beginning Birding for Adults | Adult |
| August 1 | 9:00 a.m. – 11:00 a.m. | Family Walk | All Ages |
| August 15 | 9:00 a.m. – 12:00 noon | Beginning Birding for Adults | Adult |

Visit Our Website

The Palmyra Cove Sightings Database can now be viewed on our updated and expanded website, www.palmyracove.org

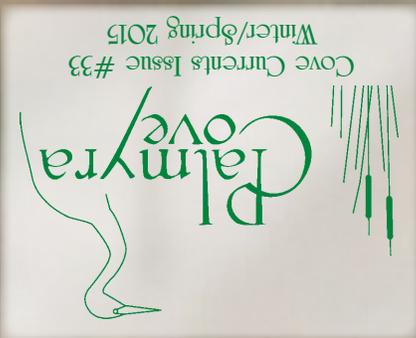


Photo by Kevin Manns
Palm Warbler

COVE CURRENTS
 Palmyra Cove Nature Park
 1300 ROUTE 73 NORTH, PO BOX 6
 PALMYRA, NJ 08065-1090
www.palmyracove.org