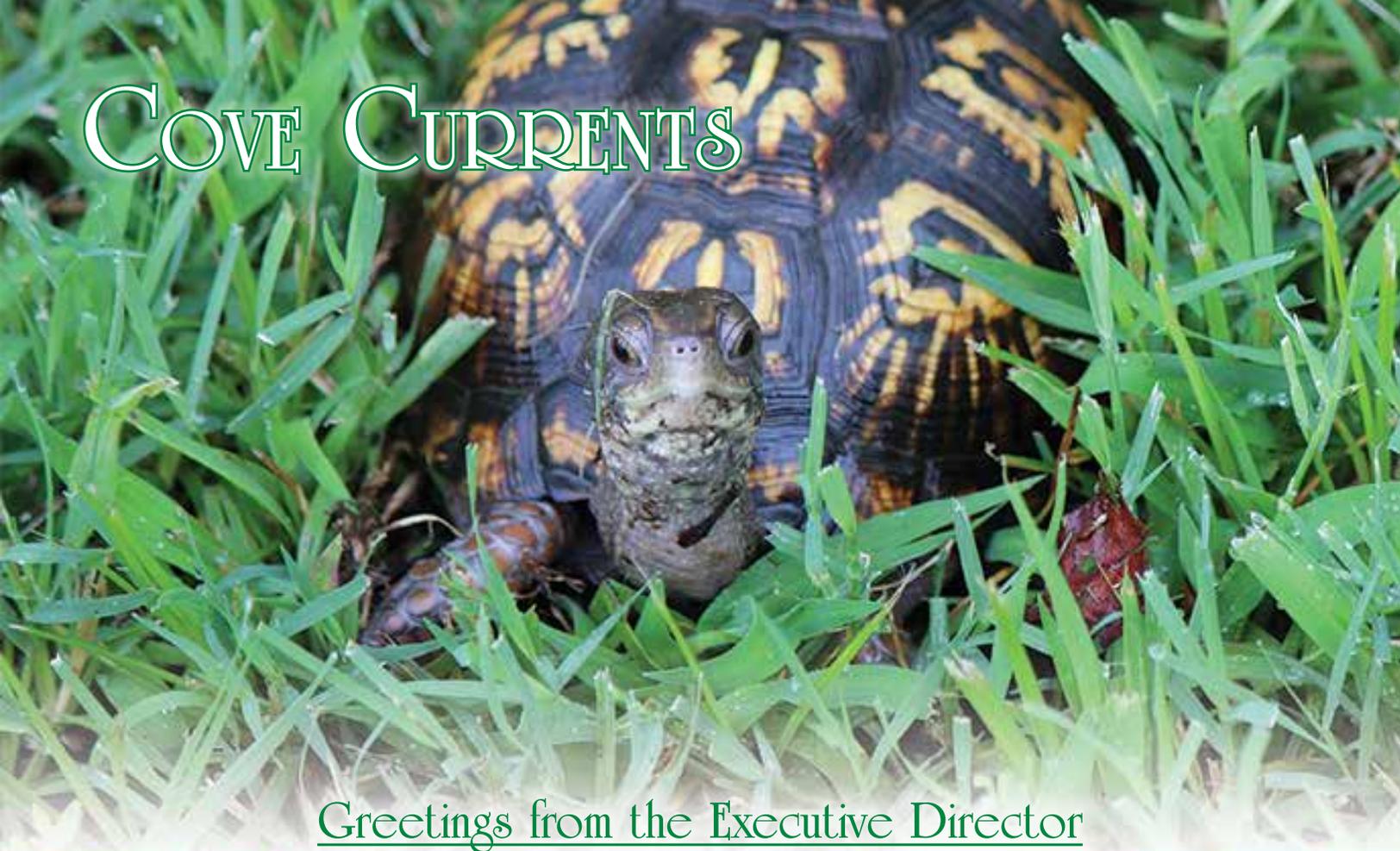


COVE CURRENTS



Greetings from the Executive Director

Given what seemed to be an endless winter, perhaps there were one or two of us who doubted that spring would return at all this year, but indeed it has with all of its beauty and promise.

Migratory birds are back in the park, tadpoles are back in the pond, owls are nesting and snakes are sunning. Best of all, students are back in record numbers for environmental science field trips.

Those of you who have been reading this column over the years know that for the past decade, our 250-acre wildlife preserve has been an outdoor classroom where we have specialized in environmental science programs for students from pre-K through college-age. Lessons are designed to maximize the students' learning experience in small groups with hands-on activities.

With our eye on the future, we are now offering programs not only rich in field experience but also filled with cutting edge technology. The introduction of age-appropriate science content and technology into our programs reinforces and enriches the overall learning experience of every student who participates.

New Jersey is an early adopter of the Next Generation Science Standards. When these Standards are implemented, every school in the state will be incorporating Science, Technology, Engineering, and Math (STEM) into its curriculum. To help schools in the region fulfill their obligation to meet the requirements of the Next Generation Science Standards, Palmyra Cove offers Geoscience/STEM programs for students and professional development programs for teachers.

Through our associations with the National Science Foundation (John Moore served as a Distinguished Einstein Fellow at the NSF from 2009-2011), the American Meteorological Society, and the National Earth Science Teachers Association, of which John Moore is the 2014 President-elect and Peter Dorofy is the Eastern Regional Director, we are intimately familiar with the trends in science and the trends in science education at the national level. Consequently, our programs are evolving not only to meet the requirements of the Next Generation Science Standards but also to meet the needs of the 21st Century workforce.

In addition, for the past decade, Palmyra Cove has been the New Jersey State Partner for the GLOBE Program (Global Learning through Observation to Benefit the Environment). GLOBE is an international program that, as its name implies, focuses on learning through observations. As the NJ Partner, we provide GLOBE Teacher Training Certification Programs. Teachers who wish to use GLOBE equipment at their schools to make observations, and then add those observations to GLOBE's international database, must be certified in GLOBE protocols. We provide those programs at Palmyra Cove and we are the only GLOBE Partner in the region.

Recently, with funding from the MKM Foundation in Philadelphia, we are establishing a Geoscience Remote Sensing Laboratory. We have purchased a digital microscope for Naturalist Kristina Merola's microbiology classes. In addition, we have purchased twenty laptop computers, a cart for charging and transporting the computers, a WeatherBug station, and a 50-inch ultra-high-definition display for tracking satellite and remote sensing data. Students participating in authentic science analyze and interpret satellite images and remote sensing



Scarlet Tanager

data from around the world. They can monitor storms, temperatures (air and sea), carbon concentrations, and moisture levels, all in real or near-real time.

This technology helps the students to visualize the world as a single entity made up of systems (earth, oceans, and atmosphere) that are interconnected and interdependent. At the Cove we believe that the study of geoscience or earth system science exemplifies the intention of STEM education in the nation. Using data from

remote sensing technology (satellites) students learn to observe, monitor, compare, and problem solve. We recognize that an important component of our education mission is to introduce students to careers in science and technology. Consequently, we are putting together the pieces to make Palmyra Cove Nature Park a regional destination for environmental science and Geoscience/STEM education.

Clara Ruvolo, Executive Director



Attracting Birds

There are an estimated 60 million birders in the United States. Some travel great distances to see and record sightings of rare species. Others don't have the resources or inclination to indulge their interest to that extent. They would rather stay close to home and enjoy their hobby, and what is closer than their own backyards?

Any number of bird species might wander into your backyard accidentally on any given day and you might catch a glimpse of them. A better way to get birds to come to your backyard is to actively work to attract them on to your property. To do this you must offer the birds some things that they need. What they need is food and water. They can and do find these things on their own but if you make it easy for them they will come and enjoy your hospitality.

First, let's consider food. Most species of backyard birds eat seeds. Bird seed can be offered in a variety of feeders. Tube feeders and hopper feeders are two very common types and will serve a large number of species. Seed and feeders can be found in most home improvement stores and in specialty shops like Wild Birds Unlimited.

Second, water. Water attracts as many birds as food. Our avian friends need water to drink and to bathe. A bird bath is a good way to provide water. Again, you can get bird baths at home improvement stores and specialty shops. Bird baths

should not be more than a couple of inches deep. Small birds like sparrows and wrens can drown in deep water.

At this point, we need to talk about squirrels. Squirrels will eat all of your bird food and leave none for the birds you are working so hard to attract. The best way to deter squirrels is to make sure the squirrels can't get the food. To do this you need some space. Hang your feeder at least 4 feet from the ground and 10 feet from anything the squirrel can use to leap on to the feeders. You must use some sort of baffle on the feeder pole to prevent the varmints from climbing to the feeder. If you do not have room in your backyard for this set up, you can try squirrel-proof feeders. They are available in a variety of styles. Some people report good results from these feeders.

After you have the basics, you might want to explore more options for feeding birds. You can try a suet feeder. Suet is a high energy treat that most species enjoy, especially woodpeckers. Peanut feeders are good for blue jays. Don't forget hummingbird feeders. Hummingbirds are my favorites, truly delightful to observe.

"If you build it they will come", and you may be surprised at the variety and abundance of species in your neighborhood.

Clyde Croasdale, Guest Contributor



Woodpecker



Blue Jay



Hummingbird

Cove Campers



Naturalist Notes - New Discoveries at the Cove



Tree Swallow

Often we hear of new discoveries found in tropical areas around the world: a new beetle discovered and named in the rainforests of Brazil, a new reptile found living amongst a stretch of Madagascar's mountainous divide, or maybe even a new bird species found on Papua New Guinea. Many first time visitors to Palmyra Cove Nature Park may discover that our park is an oasis for wildlife and may see many more animals than they expected in our

urban environment. Visitors that come regularly might discover that snapping turtles lay their eggs around the first full moon in June, that fall migration is the best time to see large numbers of warblers, and winter is a great time for observing waterfowl and owls.

We are now opening up another view of the park, one that cannot be observed with just your eyes, or even a pair of binoculars. We want to show you a world within our park that has been here the whole time, just very small -- microbiology. Through the use of our new digital microscope, we will be able to show you plants and animals you have never seen in the park before: algae, diatoms, dinoflagellates, Cyclops spp., Rotifers, Hydras, Water fleas, and other small invertebrates found in our freshwater ponds. With this new tool, we will be able to look at what makes a butterfly's wings waterproof, which species makes a nest out of paper, and how a bird's feather sticks together.

I hope you enjoy the new discoveries we will be making throughout the park. We can't wait to share with you what we have found.

Kristina Merola, *Naturalist*



Education Corner

Educational Activities: Our spring season began March 21st with Moorestown Friends and ended with a visit by Holbein Middle School on June 19th. During that three-month period, 35 schools and 2800 students participated in park programs. In addition, a number of additional schools, scouting groups, and summer camps will be participating in education programs this summer.

This past winter and spring, we had the opportunity to pilot an educational outreach program. John Moore and I, in collaboration with the Southampton Creative Team, visited the Southampton School District and introduced 3-7th grade students to Earth System science, satellite remote sensing, and the Global Learning and Observation to Benefit the Environment (GLOBE) program www.globe.gov. Palmyra Cove instructors, Claire Adair, Jill Croft, and Alexandra Lucas, facilitated an additional 6-week program focusing on the local environment and pond ecology.

Teaching Staff: I like to thank the entire Palmyra Cove teaching staff for their hard work, dedication, expertise, and most of all, patience, during this time of transition. A special thanks to Suzanne Calhoun for helping me stay on the "straight and narrow." We had a fabulous and "event free" spring. I wish all of our teachers a wonderful and relaxing summer.

Summer Staff: Our two interns Stephen Forney and Christiana Fattorini have done a fabulous job working with the school children this spring. I also like to welcome two new college interns, Sarah Cottrell, Business Administration major at Rowan University and Bradley Peditto, Biology major at Widener University.

This summer all of our interns will be engaged in setting up a remote sensing computer lab, GLOBE sites and preparing GLOBE protocols for our fall visiting schools.

A Future in Earth System STEM: Palmyra Cove is expanding its current environmental education program to include STEM (Science, Technology, Engineering, Math) based tools and skillsets as applied to the study of the geosciences. To that end, we have acquired additional equipment such as a set of student laptops, and a large ultra-high definition monitor that will be used to introduce students to GLOBE data entry and analysis, geographic information systems, remote sensing, computer visualization, and image analysis. Activities based on these technologies will be available to visiting schools in the Fall. In addition, we had a new volunteer intern, Kim Le work with the Cove staff on some of the K-12 activities. Kim is an Environmental Science and Geography major from Rowan University. After her internship ended, Kim remained on board as part of our teaching staff. This gave Kim the opportunity to share with visiting students her project work as an intern and to pilot Earth System STEM activities slated for the fall.

Around the Park: The nature park remains our most popular educational site and outdoor laboratory. Please come visit and enjoy the park this summer. The best wildlife viewing times are early morning and around dusk. If you are thinking about visiting the park in the summer, bring water to drink and wear light-colored clothes, including a hat. No matter what time of day you visit, there is always something interesting to see.

Peter Dorofy, *Director, Environmental Education*



GeoSTEM

Earth System Science, Technology, Engineering, Mathematics

On May 19, 2014, the American Meteorological Society (AMS) Council adopted a new policy statement, Earth System Science, Technology, Engineering, and Mathematics (STEM) Education. The AMS “promotes the development and dissemination of information and education on the atmospheric and related oceanic and hydrologic sciences and the advancement of their professional applications.” The AMS is recognized worldwide as the scientific society for these disciplines whose membership includes scientists, educators, researchers, government, industry, and students.

The Institute for Earth Observations views this policy as support and guidance for future program development which is underway in the current educational programming at Palmyra Cove. Apparently there is some confusion in the scientific community as to the definition of Geoscience. Because of the word “Geo,” some interpret geoscience as geology-based. Earth Science includes a multitude of topics, geology being but one aspect. The Institute for Earth Observations uses the National Science Foundation’s definition, i.e. earth, oceans, and atmosphere.

Developing a scientific literate citizenry ultimately creates a pathway for science to inform policy. Producing informed policymakers can only be accomplished through education ... formal and/or informal. This is addressed in the AMS policy statement. The AMS “recognizes the importance of Science, Technology, Engineering, and Mathematics (STEM) education in developing, maintaining, and growing an education ‘pipeline’ for the purpose of creating a world-class 21st-century workforce in the United States and stresses the benefits of integrating Earth system science as a major component of STEM. Creating a STEM education pipeline has been directly linked to the future U.S. national economy and security.” This policy statement opens the door for collaborations between the scientific and educational communities. It is important to note that the educational pipeline begins in the K12 community. This viewpoint is not widely recognized by the scientific community, making this new policy a ground-breaking policy.

Earth System STEM Education is defined by the AMS policy statement as the use of datasets, computer models and visualizations, remote-sensing technologies, and field experiences related to the study of Earth as a system. Earth System STEM Education provides ever-evolving and challenging

opportunities for students as they participate in meaningful scientific and technological experiences focusing on the Earth system utilizing an interdisciplinary, collaborative, and synergistic approach. Similar to STEM Education, the study of Earth as a System focuses on the integration and interactions within and between the four systems, i.e. Atmosphere, Biosphere, Hydrosphere, and Geosphere.

The American Meteorological Society “endorses the challenge that every precollege student be provided with the opportunity to learn about the Earth as a system through the incorporation of cutting-edge technologies as a part of STEM education, providing students with meaningful STEM learning experiences.” The AMS Earth System STEM Education policy statement can be read in its entirety at www.ametsoc.org.

This calls for the development of an Earth System STEM Master Teacher Corps proficient in the identification and utilization of remote sensing products and technologies, and the ability to incorporate geospatial and environmental intelligence into authentic learning experiences for precollege students. The Institute for Earth Observations has begun the transition from GeoSTEM to Earth System STEM. The Earth System STEM Master Teacher Corps is forming through teacher professional development programs such as the AMS DataStreme Project, GLOBE and GeoSTEM courses offered at Burlington County College. In collaboration with the National Earth Science Teachers Association (NESTA), this summer an Earth System STEM Educator’s Workshop will be offered at the Cove. More information regarding the development of an Earth System Master Teacher Corps is located on the Institute for Earth Observations page www.palmyracove.org.

Furthermore, see what Earth System STEM teachers are doing at the American Council of STEM Educators www.acstemed.org.

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



Yellow Finch



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.

August 11	9:00 a.m. – 12:30 p.m.	Photography Camp begins	5th – 8th Grade
August 16	9:00 a.m. – 12:00 noon	Beginning Birding for Adults	Adult
August 26	9:00 a.m. – 4:00 p.m.	GeoSTEM Summer Academy Day 1	Professional Development
August 27	9:00 a.m. – 4:00 p.m.	GeoSTEM Summer Academy Day 2	Professional Development
September 6	9:00 a.m. – 11:00 a.m.	Family Walk	All Ages
September 8	10:00 a.m. – 11:00 a.m.	Cove Caterpillar preschool program begins	Ages 2-5
September 8	12:30 p.m. – 1:30 p.m.	Cove Caterpillar preschool program begins	Ages 2-5
September 9	10:00 a.m. – 11:00 a.m.	Cove Caterpillar preschool program begins	Ages 2-5
September 10	10:00 a.m. – 11:00 a.m.	Cove Caterpillar preschool program begins	Ages 2-5
September 20	9:00 a.m. – 12:00 noon	Beginning Birding for Adults	Adult
October 4	9:00 a.m. – 11:00 a.m.	Family Walk	All Ages
October 4	1:00 p.m. – 5:00 p.m.	OKTOBERFEST Fundraiser	All Ages
October 13	9:00 a.m. – 4:00 p.m.	Environmental Discovery Center Closed	
October 18	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



COVE CURRENTS
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