The Newsletter of the New Jersey Earth Science Teachers Association

OMEGA

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President's Message

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National Earth Science Week is taking place **October 9-15, 2016** and this year the theme is "**Our Shared Geoheritage**." What comes to mind when you think about the theme? For me, I think of all of the geologic wonders found in our state, our country and around the world. But by including the word "shared" I also think of what the Earth has to offer is to be shared among all who live on our planet now and into the future. Throughout history acquisition of our natural resources has guided civilization to where it is today. However, without some forward thinking, we will be preventing our future populations from having the basic necessities of life if our natural resources are not managed properly now.

New Jersey's geoheritgage has provided us with our varied terrain and our natural resources. However, over time much our terrain has been modified by infrastructure, and our natural resources have been either depleted, or are no longer economical to extract. To learn more about our special geologic places, do a Google search on "Geologic History and Virtual Field Trip of the NJ Highlands" to bring up a guide with everything you need to know about one of NJ's most important physiographic provinces. To learn more about the geologic history of our entire state, do a Google search for "NJ Geology: Global and Regional Context" or "Geology of NJ." To visit some of these wonderful places search for our county-owned, state-owned, and federally-owned properties and be sure to read the literature to gain a context on how they were formed, and what they provide us in the form of ecological, cultural, educational, recreational, aesthetic, and scientific services.

To learn more about New Jersey's mining past visit the resources on the NJDEP Division of Water Supply and Geoscience website to find reports such as Copper Mines and Mining in NJ (1944), Iron Mines and Mining in NJ (1910), and a Map Archive of NJ's Abandoned Mines. Visit the USGS to find current reports (up to 2011) on our mineral (nonfuel) industry, which was valued at $275 million in 2011. NJ's copper, iron, graphite, lead, manganese, mica, sulfide, uranium, and zinc are resources in our products of the past and present. Although all that remains is our aggregate industry, our aggregates tend to find their way across the country to be used in concrete and railroad beds, for example. As we've seen

with our other mineral assets, once they are gone, they are gone. To gain an appreciation of the entire mining process, consider visiting Sterling Hill Mining Museum with your family and your students where the challenges of operating a mine come to life.

When thinking about what to do to celebrate National Earth Science Week, I know with a theme like "Our Shared Geoheritage" it will be easy to link my NGSS congruent course content with the theme. Related content can be found in all three Disciplinary Core Ideas (DCIs) for Earth & Space Science, and after drilling down into the DCIs, many of the sub-ideas are evident in the theme. Here is a list of relevant DCIs and sub-ideas:

ESS1 Earth's Place in the Universe
ESS1C: The History of Planet Earth

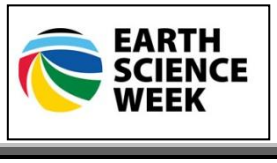
ESS2 Earth's Systems
ESS2A: Earth Materials and Systems
ESS2B: Plate Tectonics and Large-Scale System Interactions
ESS2C: The Roles of Water in Earth's Surface Processes
ESS2E: Biogeology

ESS3 Earth and Human Activity
ESS3A: Natural Resources
ESS3B: Natural Hazards
ESS3C: Human Impacts on Earth Systems

With all of the data available online along with our local environment, Science and Engineering Practices SEPs) and Crosscutting Concepts (CCCs) are easily integrated with the DCIs to create effective NGSS lessons. For example, use the mineral extraction materials found on the websites described above to have the students argue from evidence about how the natural resources formed in New Jersey. They will be "engaging in argument from evidence" as they integrated the sub ideas of ESS1C and ESS2B with "Cause & Effect" (CCC).

If you did not get your free Earth Science Week Toolkit, contact Helen Rancan, Section Chief at New Jersey Geological and Water Survey (NJGWS), at Helen.rancan@dep.nj.gov with your name and address. This year's kit is again filled with lots of resources to use now and throughout the year. – Thank you to NJGWS for your generosity and support of Earth science education! Also, visit the Earth Science Week website at http://earthsciweek.org for additional resources and ideas on how to celebrate the week with your students and community.

Finally, an appropriate quote from Will Durant: "Civilization exists by geological consent, subject to change without notice." (Durant, W. (1946). "What is Civilization?" *Ladies Home Journal*, *63*(1).)



Jersey Gems for Earth & Space Science Teachers and Students

North Jersey: Sterling Hill Mining Museum (http://sterlinghillminingmuseum.org/) will take you into NJ's geologic and historical past. Go inside what was a working mine to get a vivid idea of what the mining industry looked like up to the mid 1980's. While in the mine you will learn about NJ's deep geologic past, and mechanism that created the rich zinc deposit, and the largest collection of fluorescent rocks in the world.

Central Jersey: "Duke Farms (http://dukefarms.org) is a leader in environmental stewardship and inspires visitors to become informed stewards of the land. It is a place of education, enjoyment and research that enhances the environmental health of the region. Through the beauty of its natural setting, the diversity of its wildlife, and the scope and quality of its educational programs, demonstrations and research, Duke Farms inspires people to transform their approach to conservation and to start building a more sustainable future."

South Jersey: At Rowan University Fossil Park (http://www.rowan.edu/fossils/) "In a thin, six-inch bone bed on the site of a former marl pit, Dr. Kenneth Lacovara is leading research at the Rowan University Fossil Park in Mantua Township, N.J. The park contains thousands of fossils and provides researchers with the best window, east of the Mississippi, into the Cretaceous Period—the heyday of the dinosaurs. Fossils found at the site, include, among others, marine snails, brachiopods, bryozoan colonies, shark teeth, boney fish, sea turtles, marine crocodiles and mosasaurus."

Do you have suggestions for our list of Jersey Gems? Send them to Missy Holzer at mholzer@monmouth.com

Listservs that Rock!

ESPRIT *(Earth Science Resource Innovation Team)*

To sign up go to:
http://external.oneonta.edu/mentor/listserv.html or
http://external.oneonta.edu/mentor/esprit.html

The ESPRIT listserv has thousands of members from NY (its home state), NJ, around the country, and around the world. The membership includes early career to late career teachers from all grade levels who ask questions and share resources related pedagogy and science content. The list is prolific and dynamic! If you are the only Earth & Space Science teacher in your building or are new to the profession, here is the place for professional support. Try it out – pose a question, share a resource, or save what is share by the generosity of our Earth Science colleagues from around the world.

Tips for Transitioning NGSS into Your Classroom

The Next Generation Science Standards are still new, and finding NGSS congruent classrooms resources is still a challenge. One place to check for quality (vetted by scientists and

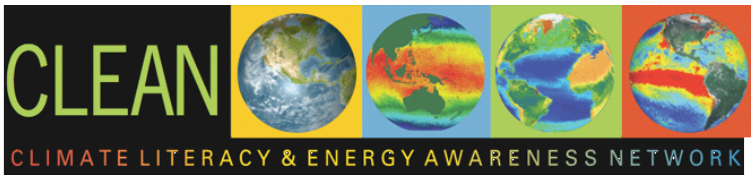
educators) resources that have been "tagged" at the NGSS "element" level is the Climate Literacy & Energy Awareness Network (http://cleanet.org/index.html). The NGSS filters for the over 600 resources can be used to single out a particular DCI, SEP, or CCC for resources appropriate for students in grades 6-undergraduate. Click on "Explore the Collection," add a topic, and then scroll down on the right side of the page to the "Other Categories" at the bottom of "Refine the Results" to filter the results to find a resource to fit your needs. For example, I put "hurricane" in the search box, and then selected the following

Resource type: Activity
Grade Level: Middle (6-8)
NGSS: DCI, Middle School > Earth and Space Sciences > MS-ESS2 > MS-ESS2.D

Results: 12 activities

The CLEAN team provides a tutorial on how to use their NGSS tagging system at: http://cleanet.org/clean/literacy/ngss.html

The CLEAN team would love to get your feedback on how you are using the NGSS tagging system. http://cleanet.org/clean/about/feedback.html



Lesson Spotlight: Topographic Teaching Tips from the USGS

This column is dedicated to teaching tips and resources specifically intended for the Earth & Space Science classroom. In this issue, "27 Ideas for Teaching with Topographic Maps" (http://education.usgs.gov/lessons/teachingtopomaps.html) is in our spotlight. Although there are so many digital mapping tools available at our fingertips, our students need to tactile experience provided by handling paper maps in order to appreciate the origin of the information found in digital maps. Furthermore, the skills acquired from working with paper maps will assist the in the interpretation of maps used in other domains such as meteorology and astronomy. So don't throw away those paper maps yet; instead visit the USGS site to learn about the different ways you can build mapping into your instruction.

NJESTA Sponsored NGSS Transition Workshop: Moving from Lessons to Assessments

It's official – the Next Generation Science Standards (NGSS) are our new state science standards. Are your lessons "blended," and more importantly are your assessments NGSS congruent? NJ Earth Science Teachers Association (NJESTA) is sponsoring two Phase 2

transition workshops for middle school and high school New Jersey Earth, space and environmental science teachers. Teachers of other science disciplines are welcome to attend; however, the examples explored during the workshop will be centered on Earth, space, and environmental science. In our Phase 1 workshops we focused on the components of the NGSS and reviewed lessons for those components. In the Phase 2 workshops we will focus on augmenting lessons and creating congruent assessments to ensure our classroom instruction blends the Disciplinary Core Ideas, Science and Engineering Practices, and Crosscutting Concepts, and our students are blending these components into their understanding of the process and practices of science. In the workshop, we will review lessons for NGSS congruency and learn how to craft "blended" assessments. Participants should have a working knowledge of the NGSS architecture and know how to access NGSS resources. Teachers are encouraged to bring copies of their own lessons for review.

See below for the details. For more information contact Missy Holzer at mholzer@monmouth.com. To register for either workshop go to http://njesta.org

Logistics

Phase 2 Dates & Locations:
Saturday October 29, 2016: Duke Farms (http://dukefarms.org)
Or
Saturday February 4, 2017: Palmyra Cove Nature Park (http://www.palmyracove.org)

Time:
Start: 8:30 AM registration, workshop begins promptly at 9:00 AM
Finish: 2:30 PM

Additional Information:
* Workshop Fee: $15
* Food: to keep the costs down, please bring your own lunch, drinks, and snacks
* After registering, a download list of necessary NGSS related documents will be sent
* Bring 4 copies of a sample lesson (one you created, or someone else created) to examine during the workshop, and to use as a starting point to develop an assessment.
* A certificate for 5 professional development hours will be provided

Registration Deadlines:
For the October 29th event the deadline is October 27th
Registration Link: https://goo.gl/forms/wzAQKvmreTGdcU023
Or
For the February 4th event the deadline is January 27th
Registration Link: https://goo.gl/forms/OO2zZfvzUvUvujc03

NJESTA Sponsored Fall Hike: Making Music at Ringing Rock!

On Saturday October 22, 2016 from 10:00 AM to 1:00 PM NJ Earth Science Teachers Association is hosting a field trip at Ringing Rock State Park. Visit one of the mysteries of the geologic world where we will explore the seven acre site with a Rutgers geologist and enjoy the sounds of a real 'rock' concert! We will rendezvous at the park. The cost is $15.00 per educator. Families welcome!. Professional Development hours will be provided. Registration can be found on www.njesta.org. Additional information will be provided after registering. Direct your questions to Missy Holzer at mholzer@monmouth.com.

Become a NESTA member for $40 per year!

The National Earth Science Teachers Association is the country's premier K-12 Earth Science teachers association offering member benefits of access to a member enhanced website (www.nestanet.org), monthly E-news, quarterly journal, and extensive outreach at all the NSTA conferences and regional events. They are at the pulse of Earth Science education and inform policy makers about the importance of Earth Science education at all grade levels. Visit the NESTA website and join NESTA and become part of a national network of Earth Science teachers all dedicated to quality Earth Science education!

RUTGERS GEOLOGY MUSEUM

The Rutgers University Geology Museum, which is open to the public, features exhibits on geology and anthropology, with an emphasis on the natural history of New Jersey. Once a month join the museum for their "Late Night" events which has a different theme each month. They also host birthday parties and tours (schools and groups). To arrange a group tour of the Geology Museum, please contact the museum staff at 848-932-7243 or museum@rci.rutgers.edu. There is no charge for admission and the museum even has a small gift/rock shop!

Not to miss in the free Rutgers Geology Museum Annual Open House, and its famous rock and mineral sale, and its lectures from cutting-edge geoscientists. It is always the last Saturday in January. See you there January 28, 2017!

Information:

Please visit their website at: http://geologymuseum.rutgers.edu/geology-museum
The Museum is located in Geology Hall; 85 Somerset Street, New Brunswick; entrance is through the iron gate on the corner of George and Somerset Streets.

Educators who attend museum presentations can receive credit toward their professional development requirements. The Geology Museum is registered as a Provider with the NJ Department of Education.

Get Ready for the Sky Event of the Decade: The 2017 All-American Eclipse of the Sun

(A Guide for How to Help Your Students and Community Understand and View it Safely)

A National Science Teachers Association Virtual Conference
with
Dennis Schatz (Pacific Science Center)
and **Andrew Fraknoi** (Foothill College)
Featuring: **Claire Raftery** (National Solar Observatory)

Saturday, October 15, 2016
10 AM - 2 PM EDT
[if you cannot attend at that time, a recorded version will also be available]

On Monday, August 21, 2017, we will be treated to the first total eclipse of the Sun visible in the continental U.S. in almost 40 years. The spectacular total eclipse will be visible in a narrow band about 60 miles across, stretching diagonally across the country from a beach in Oregon to a beach in South Carolina. However, **everyone in North America will see a partial solar eclipse,** where a big "bite" will be taken out of the Sun. When the media and social media start discussing this spectacular event, students, parents, and public audiences will need information and guidance.

In this exciting virtual conference, Dennis Schatz and Andrew Fraknoi, two experienced astronomers and educators, will:
* introduce the general topic of eclipses and what they can teach us
* explain where, when and how to view the 2017 eclipse safely
* lead a series of NGSS-aligned hands-on activities for classrooms and informal science settings
* show to get the most of the NSTA Press e-book on activities that is included with your registration fee: Solar Science: Exploring Sunspots, Seasons, Eclipses, and more
* discuss how teachers and informal educators can become a locus of eclipse education and outreach in their communities, including how to get a kit of safe-viewing glasses (with examples from what teachers are already planning)
* host an introductory discussion of the latest solar science with a scientist specializing in the study of the Sun with Dr. Claire Raftery from the National Solar Observatory

This interactive program is ideal for teachers in grades 4 – 12, science curriculum specialists, park rangers, librarians, museum educators, youth group leaders, and anyone working with the public. There is a fee for registration.

For more information and to register (**NSTA Member price:** (Includes 1 e-book) $67; **Nonmember price:** (Includes 1 e-book) $84; **Attendance/Participation Certificate:** $9.95) please go to: http://learningcenter.nsta.org/virtualconference

Earth Science Education at the 2016 NJ Science Convention

The New Jersey Science Convention sponsored by the NJ Science Teachers Association and NJ Science Education Leadership Association will take place October 25th and 26th at the Princeton Marriott Forrestal in Princeton, NJ. There are numerous Earth Science related presentations and workshops on both days making it well worth the professional development day. Visit the convention website (http://www.njscienceconvention.org/) to view the program and register. While at the convention, visit the NJDEP/NJESTA booth in the Exhibit Hall to update your membership and to pick up some free resources. See you there!

Events of Interest to the ES Teacher Calendar

Oct 8	**Lamont Doherty Earth Observatory Annual Open House** http://openhouse.ldeo.columbia.edu/
Oct. 9-15	**Earth Science Week (Everywhere!)** http://www.earthsciweek.org/index.html
Oct. 14-15	**Geological Association of NJ Annual Meeting** – Trenton, NJ http://ganj.org/2016/2016meeting.htm
Oct. 22	**NJESTA Sponsored Fall Hike: Ringing Rock State Park** http://njesta.org/
Oct. 25-26	**NJ Science Convention: Princeton, NJ** http://www.njscienceconvention.org/
Oct. 29	**NJESTA Sponsored NGSS Workshop** - Duke Farms http://njesta.org/
Nov. 19	**Earth 2 Class – Using the Latest GeoMapApp to Excite Your Classes** (LDEO, Palisades, NY) http://www.earth2class.org/
Dec. 3	**Earth 2 Class – Can You Imagine New York during the Ice Age?** (LDEO, Palisades, NY) http://www.earth2class.org/
Jan. 14	**Earth 2 Class – How Old Is It? Plate Tectonics and the Geological Time Scale** (LDEO, Palisades, NY) http://www.earth2class.org/
Jan. 20	**ANJEE Annual Conference** - Plainsboro, NJ http://anjee.net/annual-conference.html
Feb.4	**NJESTA Sponsored NGSS Workshop** - Palmyra Cove Nature Park http://njesta.org/
Feb. 11	**Earth 2 Class – Reconstructing the Storm and Industrial History of the Hudson River** (LDEO, Palisades, NY) http://www.earth2class.org/
March 18	**NJESTA Annual Conference** - Rutgers University (details forthcoming!)

Got Dates? Send to mholzer@monmouth.com w/Calendar as the subject

Editor's Note – Missy Holzer

I hope you enjoyed and have received some value from reading this installment of OMEGA. I hope that you will feel free to share article ideas, upcoming events, and your work with us, so that we can share it with all of you. Please send your ideas and dates to me at mholzer@monmouth.com. Good luck with your new school year!

NJESTA Executive Board

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Visit www.njesta.org for contact information

NJESTA Membership Note:

Is your NJESTA membership up to date? If not, visit www.NJESTA.org to renew your membership. Not sure when your membership expires? Contact Liz Georger, NJESTA Membership Chair to find out. $15/year is all it takes to receive the advantages of being a NJESTA member!