

AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS

Northeast Section **NEWSLETTER**

Spring 2018

As Published on 05/05/2018



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AIPG NORTHEAST SECTION NEWSLETTER

SPRING 2018

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Screening Board: Charles Rich (Chairperson), Don Bruehl, Carol Graff, William Penn, Daniel Toder, Andrews Tolman, William Prehoda

2018 Executive Committee Meeting Schedule:

January 8

March 12

May 18 (Spring Meeting)

July 9

September 10

October 17 (Fall Meeting TBA)

December 10

*Meetings are typically held from
4:00 to 6:00 pm at the offices of
Louis Berger Group, Elmsford, New
York, or via teleconference.*

(End)

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**Presidential
Ramblings
April 2018**
By Jessica McEachern



2018 Presidential Ramblings - Spring

I add the word “Spring” at the end of this column’s title with great hesitation. While it’s now technically Spring here in the northeast, Mother Nature seems to have other plans. As of this writing, our region has been slammed by three winter storms in less than two weeks, with another on the way. I think I speak for most people when I say the Spring Thaw is **long** overdue.

Despite that, we have gone full-speed ahead planning our Spring Meeting, confirmed for Friday, May 18th. It will be

(Ramblings continued on page 12)

(Ramblings continued from page 11)

held at the Sterling Hill Mining Museum in Ogdensburg, New Jersey. This museum is best known for its massive collection of fluorescent minerals. It was originally an old zinc mine, dating back to 1739 (making it one of the oldest in the country). When the mine closed in 1986, it was purchased by Richard and Robert Hauck and opened as a museum in 1990. The Zobel Hall area of the museum features a host of paraphernalia related to mining history - historic items, many types of rocks and minerals, as well as an exhibit on Thomas Edison, who was said to have participated in a nearby iron-mining operation (Prehoda, 2009).

For our meeting, we have been guaranteed a very informative, in-depth *behind-the-scenes* tour of the mine, which will be given by Bill Kroth, current CEO of the Mining Museum. To give you some background information (and hopefully entice you to join us): the zinc ore body found at the Mine is part of the Proterozoic age Franklin Marble, which is bounded by granitic gneiss to the northwest and Ordovician limestone to the southeast. The zinc ore bodies are found along the sides of plunging synclines within the ore body. It has been said that 357 different minerals are found in the mine area, 28 of which are unique to the area. As a bonus, many of these minerals fluoresce (Prehoda, 2009). As a highlight of the tour, we will be taking the aptly-named Rainbow tunnel, where exhibits of these rare, glowing minerals are found lining the walls.

Following the tour, Mr. Kroth will be giving a presentation related to the background and history of the mine. Please see the “[Save the Date](#)” flyer included in this newsletter for more details. It promises to be an exciting, informative geological day, and we hope to see you there!

(Source: Prehoda, B., 2009, It’s Time For A Trip! Sterling Hill Mining Museum, Ogdensburg, New Jersey, As pub-

(Ramblings continued on page 13)

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California Illinois Massachusetts New Jersey New York

lished in the NE-AIPG newsletter in 2009)

On a slightly different topic: During our most recent meeting, we on the NE-AIPG Executive Committee had a discussion regarding the newsletter and its content. Some of our members mentioned some enjoyable content from the past that we would like to revisit for future issues. One of these included the “News of Members” section ([Pg 19](#)), where NE-AIPG members would discuss their latest projects over the course of a few sentences to a paragraph or two. We all agreed this section was a pleasure to read and we would like to reincorporate it into our newsletter once. To that end, you have any information on your current projects you would like to share, I invite you to send it to Brandon, our newsletter editor, at btufano@rouxinc.com. We would be happy to include it in a future issue.

- Jessica

(End)

Have an idea for a Newsletter Article?
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incorporate our member's
ideas and experiences
into the quarterly Newsletter!

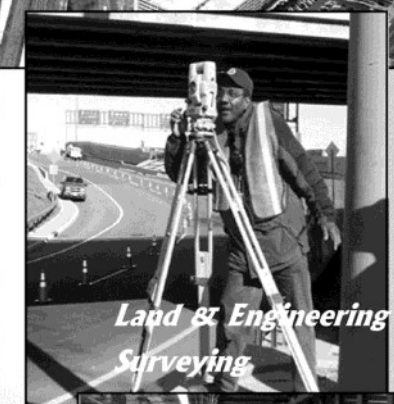
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**AMERICAN INSTITUTE OF PROFESSIONAL
GEOLOGISTS - NORTHEAST SECTION
SPRING MEETING ANNOUNCEMENT**

Friday, May 18, 2018



This event features a *behind-the-scenes* tour of
Sterling Hill Mining Museum
Ogdensburg, New Jersey

Please join us for the business meeting, networking, lunch, tour, and an afternoon presentation

OPEN TO ALL AIPG MEMBERS AND OTHER SCIENTISTS

Registering and paying is easy. Please visit <http://www.ne-aipg.org> (click on “meetings” and scroll down)

Registration On-line is available to All, regardless of affiliation

AGENDA

11:30 - 1:00 PM Networking and Light Lunch - Sterling Hill Mining Museum, Ogdensburg (held in GeoTech Center)

12 PM - 12:20 PM Introduction and Acknowledgment of Sponsors

1:00 - 3:30 PM Field Trip – Behind-the Scenes Tour of Sterling Hill Mining Museum

3:30 - 4:30 PM Afternoon Speaker: William Kroth will present the background and history of Sterling Hill Mine

(Spring Meeting continued on page 16)

(Spring Meeting continued from page 15)

You are welcome to attend all or any portion of the day's program but please register on-line so that we can anticipate your attendance.

Tour: Sterling Hill Mining Museum

The Sterling Hill Mining Museum is located at 30 Plant Street, Ogdensburg, New Jersey. Come join us for a guided behind-the-scenes tour featuring a massive collection of fluorescent minerals. The area represents a varied and exciting story geologically speaking. The zinc ore body found at the Mine is part of the Proterozoic age Franklin Marble, which is bounded by granitic gneiss to the northwest and Ordovician limestone to the southeast. The zinc ore bodies are found along the sides of plunging synclines within the ore body.

It has been said that 357 different minerals are found in the mine area, 28 of which are unique to the area. Many of these minerals have fluorescent properties. A highlight of the tour is the aptly-named Rainbow tunnel, where exhibits of rare minerals that grow bright green and red under ultraviolet light line the walls.

The Mine itself also has a very interesting history. Mining of the local zinc deposits began sometime before 1739, and it is said that Thomas Edison participated in a nearby iron-mining operation. If you have time, check out the exhibits in the museum's Zobel Exhibit Hall, which features a host of paraphernalia related to local mining history.

**It is recommended that you arrive at least 10 - 15 minutes before the start of the tour.
12:45 pm**

Please follow the link below for directions to the Museum.

Afternoon Presentation:

The Background and History of Sterling Hill Mine
William Kroth, President & CEO of the Sterling Hill Mining Museum

Over the last two decades, the New Jersey Highlands have been extensively re-mapped by geologists of the New Jersey Geological Survey. The new detailed maps, combined with carbon and oxygen isotopic studies and a series of precise age determinations to put the rock units in proper chronological context, have produced a conceptual plate-tectonic model of the evolution of the region. It is now generally accepted that the ore deposits at Franklin and Sterling Hill originated as hot, metalliferous brines that were discharged onto the floor of a shallow sea about 1.3 billion years ago.

(Spring Meeting continued on page 17)

(Spring Meeting continued from page 16)

Spring Meeting Registration On-line

Registration and payment on-line is open to all organizations and guests, regardless of affiliation; you can register under your organization at <http://www.ne-aipg.org> (click on meetings) or use the form below to register by mail or email

The tour is free, but please register so we can accommodate everyone.

Mail-in or Email Registration

Yes! I (We) plan to attend the networking, Light lunch, afternoon meeting and presentation at Sterling Hill Mining Museum, 30 Plant Street, Ogdensburg, NJ 07439, on Friday, May 18, 2018

I will bring my check for \$30 per person (includes lunch) with me.

Name(s): _____
(Please print clearly)

(Organization)

Please mail your registration to:

NE Section AIPG
c/o Bob Blauvelt
345 Stuyvesant Avenue,
Lyndhurst, NJ 07071

or email to rblauvelt@geiconsultants.com

Venue Information and Directions Sterling Hill Mining Museum

30 Plant Street, Ogdensburg, NJ 07439; Tel: (973) 209-7212

Directions to the museum from various approaches can be found at: <http://sterlinghillminingmuseum.org/visitor/directions.php>

It is recommended that you arrive at least 10 - 15 minutes before the start of the tour. 12:45 pm

(End)



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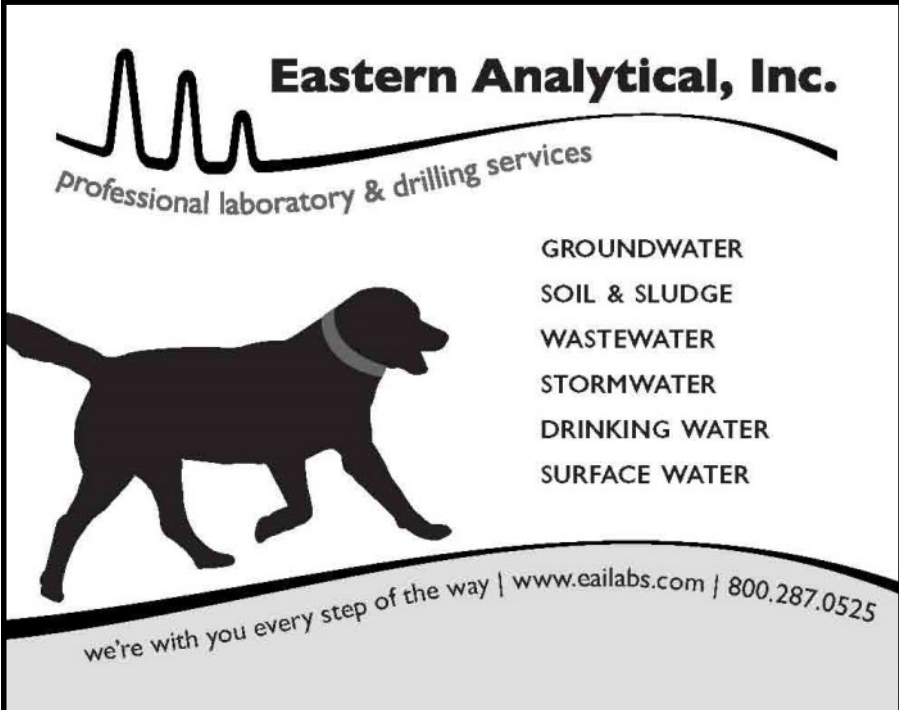


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News Of Members

Dorothy Richter (CPG-07033) started a new firm, RICH-TER GEOLOGY PLLC (www.richtergeology.com), in February, 2018 after selling her old firm of 34 years to longtime employees in a cordial internal ownership transfer. RICH-TER GEOLOGY PLLC offers independent third party review, oversight, and consulting services, and litigation support in Geology & Geophysics. "I started my old firm at the kitchen table 34 years ago and am excited to be back at the kitchen table again. I fondly remember being pleasantly surprised at some of the referrals and support in the early years of the first firm, including an encouraging handwritten letter from Russ Slayback. I am hoping to be pleasantly surprised again! If there is one thing that I have learned from my longtime professional colleague and dear husband, Gene Simmons, Ph.D., P.G., it is never, never to retire!"

Brandon Tufano (MEM-229020) started working for Roux Environmental Engineering and Geology, D.P.C., in June of 2016 and took over the role of Editor for the Northeast Section of AIPG that December. Roux offers a wide range of environmental services for Fortune 500 companies and mom and pop style businesses alike. Within the company structure, Brandon focuses on developing realistic endpoint goals for sites with petroleum related impacts by utilizing light non-aqueous phase liquid transmissivity to define system shut-down metrics. Brandon also provides niche services related to utilizing phytoremediation as an alternative measure to preferentially uptake and evapotranspire BETX while simultaneously biodegrading in-situ petroleum.



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Magmatic Hotspot Rising Under New England?

Modified from Erin Blakemore

New England, that geography conjures picture of streams crisscrossing a landscape of rolling weathered mountains, blanketed in colorful forests, come the Fall. The geology here is old; tectonic quiescence has dominated since Jurassic Rifting left us with an ocean on our doorstep. "At first glance, New England doesn't seem like a hotbed of geologic activity. The region doesn't have any rumbling volcanoes. Earthquakes are almost unheard of. This stolid surface potentially betrays a more active subsurface. This idyllic pocket of the northeastern United States may sit atop a rising mass of warm rock—a smaller, slower version of the magma pockets under well-known hotspot volcanic zones. The findings, recently published in the journal *Geology*, suggest that New England may not be geologically quiescent as it first appears.

A team of researchers at Rutgers University and Yale University made this surprising discovery using an advanced array of seismic sensors, which show what lies in the otherwise hidden rock below our feet.

(Article continued on page 23)

(Article continued from page 22)

“Ten years ago, this would not have been possible,” says study coauthor Vadim Levin, a professor at Rutgers University-New Brunswick’s department of Earth and planetary sciences. “Now, all of a sudden, we have a much better eye to see inside the Earth.”

Rising Rock

Inside our planet, heat from the molten core makes its way up through the mantle—the hot, high-pressure zone that lies below the planet’s crust. This convective process causes the crust’s tectonic plates to slide around. These convergent or divergent boundaries are most often seen in mountains, earthquakes, and volcanoes. (These mesmerizing pictures show lava flows from the air, land, and sea.)

Since we can’t see that deep into the planet, geologists use seismic vibrations caused by earthquakes to visualize the features within rock. Sensing how fast seismic ripples move, for instance, provides details about the structure and temperature of Earth’s mantle.

In this case, Levin’s team studied data from EarthScope, a National Science Foundation program that deploys hundreds of geophysical instruments across the United States.

(Article continued on page 24)



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(Article continued from page 23)

The project’s Transportable Array, a temporary network of seismic sensors, made its way around the country starting in 2007. The array picked up readings from small earthquakes and observed the motions of seismic waves in various regions.

The team piggybacked off previous research showing a relatively hot spot beneath New England’s upper mantle. Using data from EarthScope, they then observed a localized plume of warm rock beneath central Vermont, western New Hampshire, and western Massachusetts—and

(Article continued on page 25)

(Article continued from page 24)

found geologic evidence that it's on the move.

Less dense areas are where the rock is hotter, and seismic waves move more slowly. That's what the team saw under New England. They also observed wave patterns that suggest deformations in the rock itself.

Normal plate motion leaves the geologic equivalent of skid marks in its wake, which seismic sensors can detect. In this region, however, the skid marks were gone—erased by the upward movement of warmer rock.

Shifting Perspectives

New England residents don't need to panic. The upwelling is likely tens of millions of years old, which would make it a relatively recent development in geological terms, and it's moving very slowly. For now, it certainly hasn't gotten close enough to the surface to shape New England's geography or create a volcano.

"Maybe it didn't have time yet, or maybe it is too small and will never make it," says Levin. "Come back in 50 million years, and we'll see what happens."

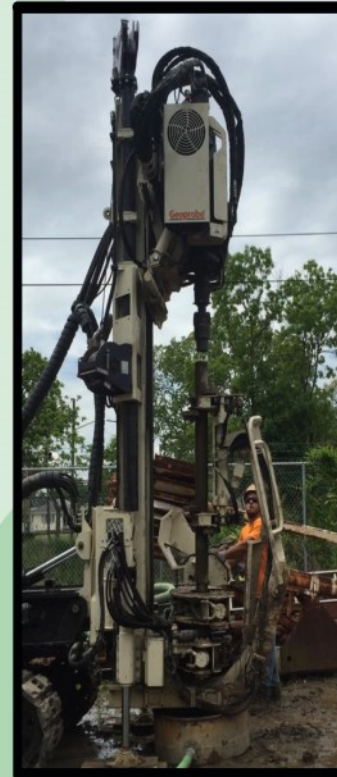
Instead, the discovery is a sign that it may be time to rethink the region's geology.

(Article continued on page 31)



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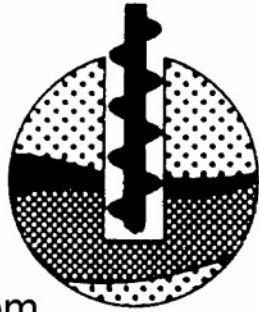
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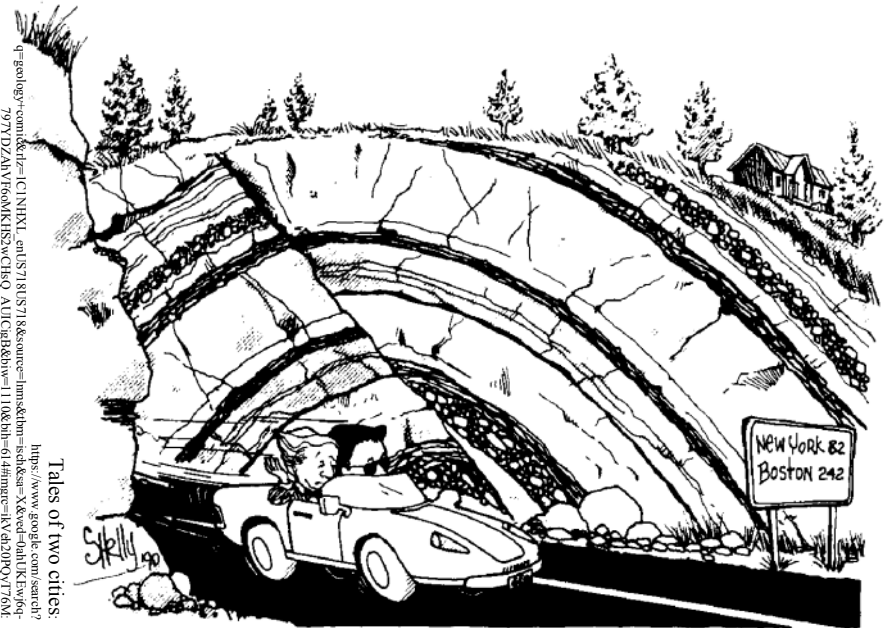
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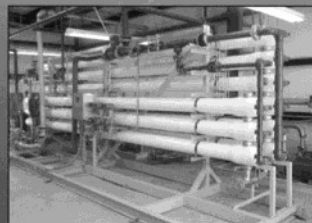
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(Article continued from page 25)

The big takeaway from this paper is that Earth's structure is even more intricate and dynamic than anyone realized, says Meghan S. Miller, a structural seismologist and associate professor at the Australian National University's Research School of Earth Sciences who was not involved in the project.

"I think that kind of sounds simple and obvious in retrospect, but the Transportable Array data has allowed us to visualize how complex Earth's structure really is," she says.

The find also helps put the planet in perspective, says Levin. New England has traditionally been considered a place of little geologic change, but EarthScope data suggests that the subsurface reality is anything but stagnant.

Citation:

Blakemore, E. (2017, December 05). Huge Bubble of Hot Rock May Be Rising Under New England. Retrieved April 01, 2018, from <https://news.nationalgeographic.com/2017/12/magma-bubble-rising-under-new-england-volcanoes-science/>

(End)



Sediment core from sluice pond contains evidence for 1755 New England earthquake

By: Seismological Society of America

Signs of a 1755 earthquake that was strong enough to topple steeples and chimneys in Boston can be seen in a sediment core drawn from eastern Massachusetts' Sluice Pond, according to a new report published in *Seismological Research Letters*.

Katrin Monecke of Wellesley College and her colleagues were able to identify a layer of light brown organic-rich mud within the core, deposited between 1740 and 1810, as a part of an underwater landslide, possibly unleashed by the 1755 Cape Ann earthquake.

The Cape Ann earthquake is the most damaging historic earthquake in New England. While its epicenter was probably located offshore in the Atlantic, the shaking was felt along the North American eastern seaboard from Nova Scotia to South Carolina. Based on contemporary descriptions of damage from Boston and nearby villages, the shaking has been classified at modified Mercalli intensities of "strong" to "very strong" ((VI-VII), meaning that it would

(Article Continued on Page 35)



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(Article continued from Page 32)

have caused slight to moderate damage of ordinary structures.

New England is located within a tectonic plate, so "it is not as seismically active as places like California, at an active tectonic plate margin," said Monecke. "There are zones of weakness mid-plate in New England and you do build up tectonic stress here, you just don't build it up at the same rate that would occur at a plate boundary."

With few faults to study, however, researchers like Monecke and her colleagues are looking for signs of seismically-induced landslides or the deformation of soft soils to trace the historic and prehistoric record of earthquakes in the region.

Monecke hopes that the new Sluice Pond core will give seismologists a way "to calibrate the sedimentary record of earthquakes in regional lakes," she said.

"It is important to see what an earthquake signature looks like in these sediments, so that we can start looking at deeper, older records in the region and then figure out whether 1755-type earthquakes take place for example, every 1000 years, or every 2000 years," Monecke added.

The researchers chose Sluice Pond to look for signs of the Cape Ann earthquake for a variety of reasons. First, the lake is located within the area of greatest shaking from the

(Article continued on Page 36)

(Article Continued from Page 35)

1755 event, "and we know from other studies of lakes that have been carried out elsewhere that you need intensities of approximately VII to cause any deformation within the lake sediments," Monecke said.

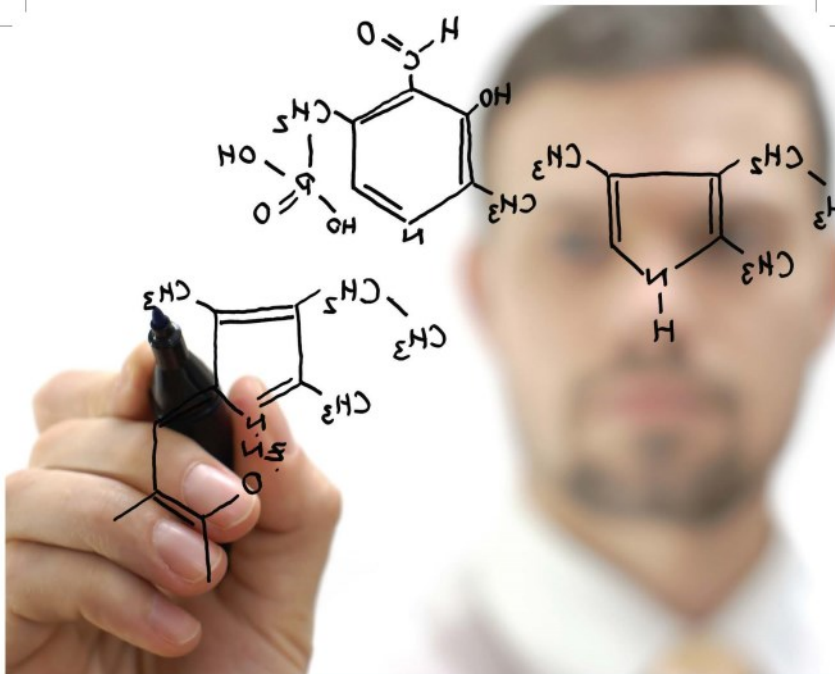
Sluice Pond also has steep sides to its center basin, which would make it susceptible to landsliding or underwater sliding during an earthquake with significant shaking. The deep basin, with a depth of close to 65 feet, also harbored a relatively undisturbed accumulation of sediments for coring.

Through a painstaking analysis of sediment size and composition, pollen and plant material and even industrial contaminants, the research team was able to identify changes in sediment layers over time in the core. The light brown layer deposited at the time of the Cape Ann quake caught their eye, as it contained a coarser mix of sediments and a slightly different mix of plant microfossils.

"These were our main indicators that something had happened in the lake. We saw these near shore sediments and fragments of near-shore vegetation that appear to have been washed into the deep basin," by strong shaking, said Monecke.

In an interesting twist, land clearing by early settlers from as far back as 1630 may have made the underwater slopes

(Article Continued on Page 39)



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(Article Continued from Page 36)

more susceptible to shaking, Monecke said. Sediment washed into the lake from cleared land loads up the under-water slopes and makes them more prone to failure during an earthquake, she noted.

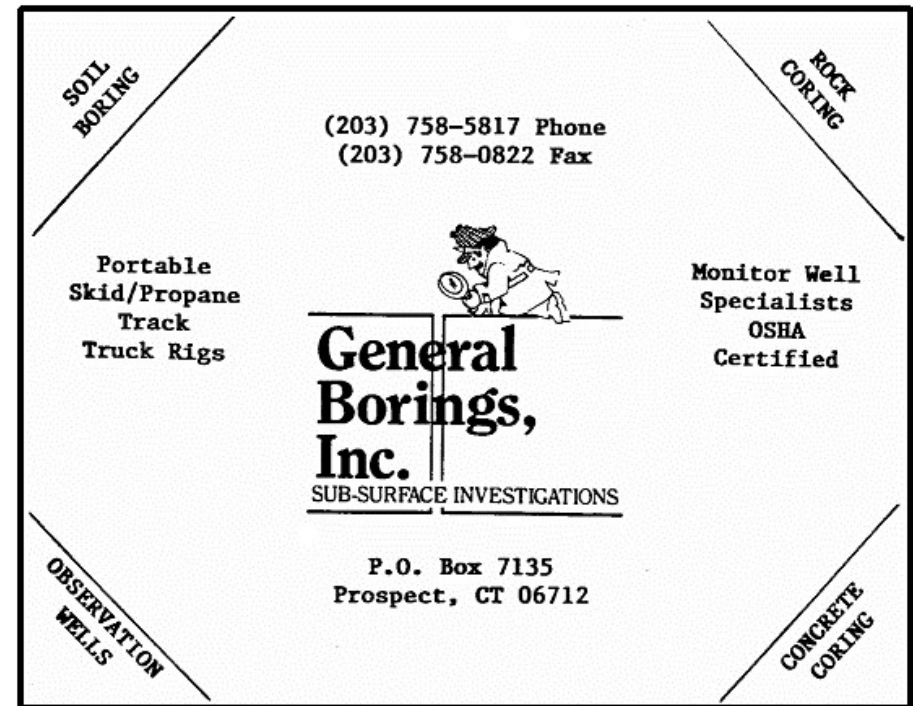
For that reason, the sediment signature linked to prehistoric earthquakes may look a little different from that seen with the Cape Ann event, and Monecke and her colleagues are hoping to sample even older layers of New England lakes to continuing building their record of past earthquakes.

The research team is taking a closer look at a more famous New England body of water: Walden Pond. "It got slightly less ground shaking [than Sluice Pond] in 1755, but it might have been affected by a 1638 earthquake in southern New Hampshire," Monecke explained. "We already have sediment cores from that lake, and now we are unraveling its sedimentary history and trying to get an age model there as well."

K. Monecke et al. The 1755 Cape Ann earthquake recorded in lake sediments of eastern New England: An interdisciplinary paleoseismic approach. *Seismological Research Letters*, 2018
DOI: [10.1785/0220170220](https://doi.org/10.1785/0220170220)

Seismological Society of America. (2018, March 27). Sediment core from sluice pond contains evidence for 1755 New England earthquake. *ScienceDaily*. Retrieved April 1, 2018 from www.sciencedaily.com/releases/2018/03/180327132032.htm

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Wider coverage of satellite data better detects magma supply to volcanoes

By: Penn State

Using satellite imaging, Penn State researchers for the first time identified a major magma supply into a reservoir extending almost two miles from the crater of a volcano in Nicaragua.

This shows that volcanoes can be fed magma through nearby underground channels and could help explain how volcanoes can erupt seemingly without warning because the active center of the volcano exhibits little deformation activity. The findings were published March 28, 2018 in *Geophysical Research Letters*.

A team led by Christelle Wauthier, assistant professor of geosciences and the Institute for CyberScience, used satellite data to chart movement of the ground surrounding Masaya Volcano, an active volcano and popular tourist destination near millions of residents near Managua.

Using Interferometric Synthetic-Aperture Radar (InSAR), a

(Article continued on page 43)

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(Article continued from page 59)

technique that uses radar satellite remote-sensing images, the team found ground swelling of more than three inches in a large area north of the crater. They used comparative data taken at different points in time to determine increases in magma supply. That work was corroborated by independent gas measurements taken at the crater by another team. Charting ground inflation near volcanoes is one way to determine the likelihood of a future volcanic eruption. InSAR can measure changes of one-third of an inch in the topography of Earth.

Kirsten Stephens, a doctoral student in geosciences at Penn State, said InSAR data helped the team spot an increase in magma supply whose extent and amplitude can be missed or underestimated by ground-based sensors like GPS.

"When you're using the satellite data you're actually looking at a wide area as opposed to a GPS station, which is one point

(Article continued on page 44)



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(Article continued from page 43)

of measurement on the Earth," Stephens said. "With satellite data, we're looking at hundreds by hundreds of kilometers of Earth. With this better spatial coverage, we were able to image this inflating ground movement related to this 2015 lava lake appearance, which no one had captured before."

Wauthier said this research changes how we should monitor volcanoes.

"This shows that you should monitor close to the active vent area but also farther away to get a broader picture of the magma processes," Wauthier said. "This is clear evidence showing magma can be supplied in large quantities further away from the point of eruption."

Wauthier suspects the magma pathways are related to a pre-existing caldera structure that was formed during the collapse of the volcano 2,500 years ago. Masaya -- like Wyoming's Yellowstone Caldera -- is not conical shaped. Past magmatic activity caused the roof of a reservoir to fall out, creating a depression at the point of eruption. Weak zones could have been formed during this event and could currently serve as magma pathways, Wauthier said, but it will take more research to determine that.

"The offset magma supply has a lot of consequences interpreting volcanic unrest, because if you would have been

(Article continued on page 45)

(Article continued from page 44)

looking at the active event only, you might have missed most of the inflation," Wauthier said. "You might not have realized that there was a lot of magma accumulating below the ground."

The last time Masaya had a massive eruption was in 1772, and a lava lake has often been visible at the summit since then. However, the volcano has been showing signs of activity, with its most recent explosive eruption -- which lasted for about a week -- occurring in 2012. The 1772 eruption spewed ash and molten lava more than 30 miles. Today, about 2 million people live within 12 miles of the volcano.

"The volcano has the potential to be very explosive and create very big eruptions," Wauthier said. "That's why we focused on this area. Because there are so many people living around there, we want to understand what's going on at that volcano and where the magma reservoirs and pathways are. If magma supply is increasing significantly, it's a sign the volcano could become more active."

Stephens said the team is now working on a follow-up study using their massive amounts of remote sensing data sets provided by seven satellites, together with ground-based measurements acquired by Associate Professor of Geosciences Pete LaFemina, to model the temporal evolu-

(Article continued on page 46)

(Article continued from page 45)

tion of the magma supply in more detail.

"Through inversion modeling you can then get an estimate of the change in volume," Stephens said. "You can get a rough estimate of how much magma was supplied into the system within that time." NASA and the National Science Foundation funded this research.

K. J. Stephens, C. Wauthier. Satellite Geodesy Captures Offset Magma Supply Associated With Lava Lake Appearance at Masaya Volcano, Nicaragua. *Geophysical Research Letters*, 2018; DOI: [10.1002/2017GL076769](https://doi.org/10.1002/2017GL076769)

Penn State. (2018, March 28). Wider coverage of satellite data better detects magma supply to volcanoes. *ScienceDaily*. Retrieved April 1, 2018 from www.sciencedaily.com/releases/2018/03/180328130736.htm

(End)

If you have a suggestion for a future section meeting presentation, venue, or field trip, reach out to the NE/AIPG team and share your ideas and opinions.

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From the Editor

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In preparation for the upcoming Spring Meeting and trip I have resurrected an article Bill Prehoda wrote in 2009NE/AIPG Newsletter, concerning the Sterling Hill Mine tour: Enjoy!

It's Time For A Trip! Sterling Hill Mining Museum Ogdensburg, New Jersey

It has been a long while since I went to the Sterling Hill mine in Ogdensburg, New Jersey. So, in the summer of 2009, when The New York Philadelphia section of the AEG announced a field trip there this, I figured it would be a good opportunity to re-visit the world-famous zinc mine - it was a good choice.



It was a picture-perfect day in June, 2009 when we met at the mine. After a meet and greet, we were first directed down the hill from the parking lot into the Zobel Exhibit Hall. We were greeted by very knowledgeable guides, who

(Sterling Hill Article Continued on page 50)

(Sterling Hill Article Continued from page 49)

actually worked in the mine at one point in time. Tales of what went on in the mine before it closed down in 1986 (after over 130 years of production) bring you into another point in time, to a way of life that few of the general population have experienced. It was a way of life long gone for many, but still alive for a few hard-working individuals who toil in the remaining mines all over the world. Looking around in the 1930's vintage Zobel Hall, originally a locker room, I truly think that if you were into mining and mining history, that you could probably spend most of the day in this one building (Coming from a mining background - I know I could have). The place is just jam packed with historic items – reportedly over

20,000! What is in there? Just about everything associated with everyday life in this mine and other items (including a railroad track car toilet – a must see). There are many types minerals and ore specimens, fossils, meteorites and an exhibit on Thomas A. Edison, who was reportedly involved in operating an iron-mining operation nearby. My



(Sterling Hill Article Continued on page 52)

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(Sterling Hill Article Continued from page 50)

favorite part of the exhibit is the mining equipment – I just like to see what the everyday miner had his (not many hers in those days) hands on every day. The variety of hand tools and eventually power tools, seems endless. From early hand drills to the more modern pneumatic drills, all sorts of track equipment, different types of crushing equipment, explosives, etc. Looking around at all of the paraphernalia is a bit daunting, but looking up to the open ceilinged building is even a bit more perplexing; from the roof and rafters hangs a silent army of wire baskets and hangers suspended by a system of chains and pulleys. A very unique exhibit, illustrating how the miners dried their clothes. At the end of each day, they would hang their wet clothes on the hangers on the baskets and the shoes would go into the baskets. The baskets were then hoisted up to the warmer part of the building near the ceiling. When the miners arrived in the morning, they donned nice dry clothing for another day in the mine.

OK, so we don't have time to spend all day in the Zobel Exhibit Hall, so we proceed back outside to the parking lot to meet our mine tour guide. His name was Earl Verbeek and probably was one of the more interesting guides I have been with on any tour. His knowledge of the mine was thorough, and his background as a USGS geologist (retired)

(Sterling Hill Article Continued on page 55)

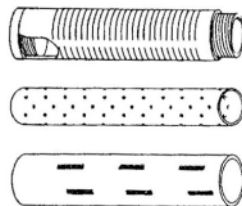
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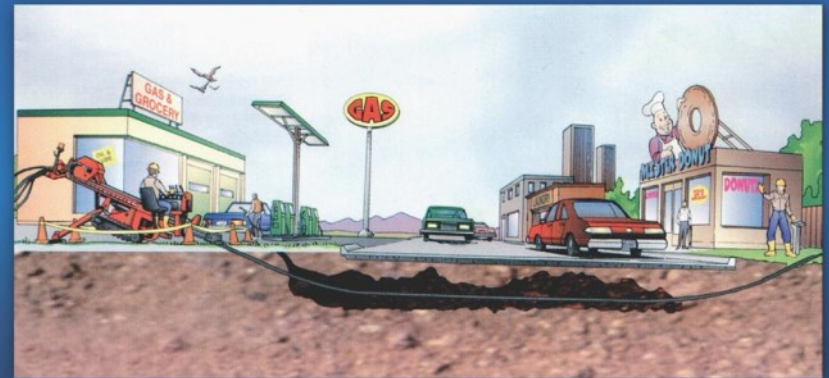
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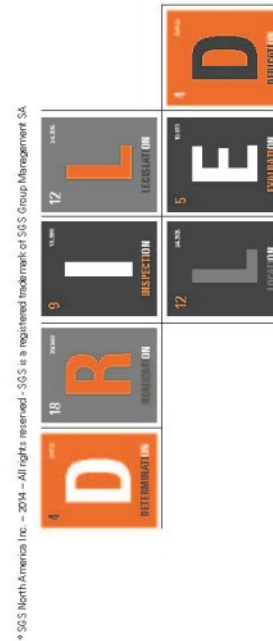
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(Sterling Hill Article Continued from page 52)

who spent most of his career out West, more than qualifies him to lead us on a tour of the mine. As a side note, Earl has a very interesting video out on the web that is essentially an interview of him on the topic of “why I became a geologist”, it is an excellent video and I highly recommend viewing it. It is on YouTube at: <http://www.youtube.com/watch?v=Bu0MdnCBnsY>.

Earl gave the group a brief history of the mine, and the reasons why it is world famous (for the uninitiated, obviously). The zinc ore body at the Sterling Hill Mine is located in the Proterozoic age Franklin Marble, bounded by granitic gneiss on the northwest and the Ordovician Kittatiny Group (limestone) to the south east. The zinc orebodies are located along the sides of plunging synclines within the orebody. The zinc ore at the New Jersey Zinc company mine averaged more than 20% zinc content, 4 to 5 times the average of many other mines. It is estimated that over 11 million tons of this rich ore were mined here. Although there is estimated to be over a million tons of ore remaining in the mine, the depressed zinc prices and property tax disputes led to the closing of the mine in the mid-1980's. The cost of reopening the mine today is prohibitive relative to the remaining resource. The museum has been open since 1990.

(Sterling Hill Article Continued on page 59)



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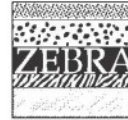
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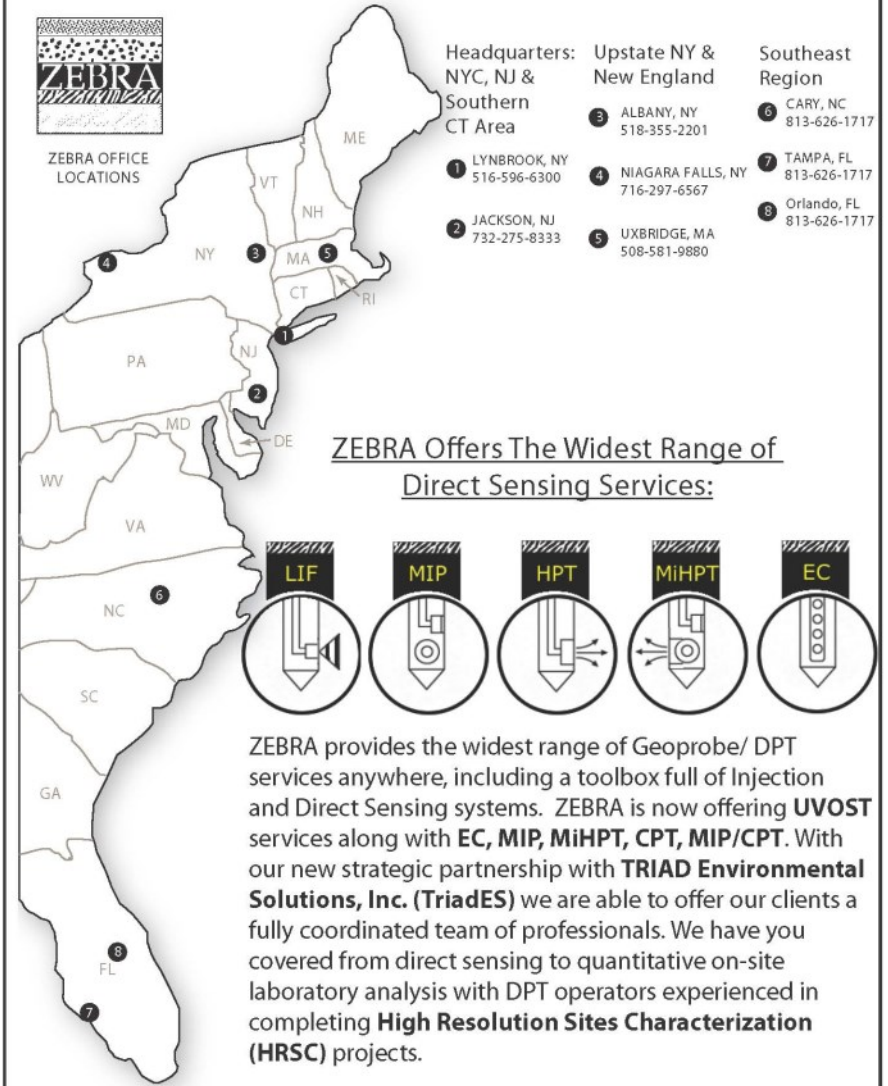


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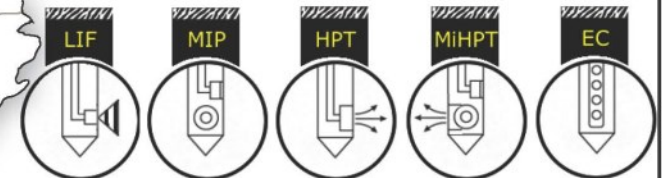


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(Sterling Hill Article Continued from page 55)

OK, so the ore was concentrated, but that is only part of the world-famous story, the other part involves the mineral assemblages. Reportedly, 357 different minerals are found in the mine area, with a bonus that 28 of these minerals are unique to this area (read – found nowhere else). If those numbers don't boggle the mind, then add to it the fact that many of these minerals fluoresce (hence the moniker "The Fluorescent Mineral Capitol of the World"). According to those in the know, the Sterling Mine area is number three on the list of sites with the most unique minerals, behind Mount Saint-Hilaire, Quebec and Clara mine in Germany. Pretty impressive. Franklinite, willemite, zincite, are some of the more familiar mineralogical specimens found here and are the primary zinc ore minerals.

Although the day is nice and the talk interesting; it is time to head to the mining operations. Earl indicates that we are going to "work our way down", literally, by starting at the highest point at the mine – which we all know is the headworks.



(Sterling Hill Article Continued n Page 60)

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We jump in our cars for a short ride around and up the side of the hill towards the main shaft opening for a "special" tour of the not-too-often-seen portion of the mine. When Earl said start at the top, he meant it, we not only went to the headworks, but proceeded to climb the open stairs to the top where the draw works were located (not for the faint of heart). We passed painters working diligently on the sprucing the structure up, first a coat of white paint then eventually mine gray. The view at the top was worth the climb – the view of the New Jersey Highlands was excellent, and a far cry from most people's view of New Jersey from the Turnpike! At the top, you can look down the track that the ore cars took, and right down into the bin where the ore was dumped.

We proceeded back down the stairs and back onto solid ground on our way to see what happens to ore after it comes out of the mine. We entered the building where the ore was processed, milled and sorted, eventually landing on a long conveyor belt that ends up in the shipping bins located in the yard. The building where the processing takes place is so full of equipment (original and stored stuff), that you just kind of stare in amazement at the sheer complexity of it all. Since its not part of a regular tour, there have been no attempts to "pretty it up", and it shows! Earl freely admits

(Sterling Hill Article continued on page 61)

(Sterling Hill Article continued from page 60)

that, even though the mine was closed not all that long ago, the exact process flow in this mill has not yet been figured out. They are continuing to determine what went on here by evaluating all the equipment, interviewing former workers and gathering as much information as they can in the hope that someday this will be a very unique exhibit space in and of itself. Proceeding out of the mill, we walked through the long conveyor belt enclosure to the storage bins. The windows along the conveyor were caked with grime, to the point where they were more like ugly stained glass than something you were supposed to see through. Earl leads us down the stairs by the storage bins, to the yard, and across the parking lot where the mine adit is located. We pass by some old mine equipment on the way and as the adit door is opened; we are greeted with a blast of cool, damp mine air. The museum has opened and preserved a nice loop (about 1,300 feet long) of the mine on the upper level that you can walk through and view a variety of informative displays.



(Sterling Hill Article continued on page 63)

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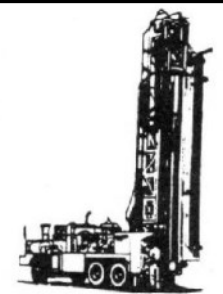
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(Sterling Hill Article continued from page 61)

Once inside the adit door, we are shown some 3-4 inch long stalactites hanging from the mine roof, the result of percolating water through the fractures in the mine walls. Earl begins telling us about the physical layout of the mine. We are on the top level of 25 different levels, with the lowest working level of the mine located at a depth of 2,550 feet below where we were standing (which is also below sea level). The actual lowest level in the mine is 2,675 feet at the North shaft. In total, there are about 35 miles of mine passages. Reportedly, the Dutch probably started mining in the area prior to 1750, actually thinking that the brownish zinc ore was copper. Major mining operations began at the Sterling Mine in the late 1890's.

We walked through a set of air doors (controlling air circulation) and are shown an area where the adit is lined with steel due to a fracture zone in the rock that would collapse

STATION	BELLS
SURFACE	5
ADIT	1-1
180	1-2
340	1-3
430	1-4
500	2-1
600	2-2
700	2-3
800	2-4
900	3-1
1000	3-2
1100	3-3
1100 POCKET	3-3-2
1200	3-4
1300	4-1
1400	4-2
1500	4-3
1600	4-4
1680	5-1
1750	5-2
1850	5-3
CRUSHER	5-4
1850 POCKET	5-4-2
HOIST TO TIPPLE	1
STOP OR CLEAR	1
LOWER SLOW	2
HOIST SLOW	3

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LEVEL SIGNAL

(Sterling Hill Article continued on page 64)

(Sterling Hill Article continued from page 63)

if not supported. For the most part, the mine has very few "bad" zones, and is pretty solid. We were shown the lamp room, where the miners checked in and out every day and made sure they had one of the most important pieces of equipment – their headlamp. Thomas Edison invented the electric cap lamps and chargers, which represented a significant reduction in the danger of fires from the previously used open flame lamps.

The next stop is the shaft station, where the mine cars/skips came down from the headworks and up from the mine. This particular shaft is the most recent and the largest, constructed on a 52-degree incline and has a bottom

(Sterling Hill Article continued on page 65)

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(Sterling Hill Article continued from page 64)

sump located at 2,065 feet below where we were standing. Earl pointed out the flowstone on the walls, which forms quite readily here. Free-standing toilets, complete with buckets, were available in this area, but no one had the urge.

We subsequently encountered an ore pass, where ore was dropped from one level to another (using gravity is always best), passing through a “grizzly”, which screened out bigger chunks (which had to be broken to smaller pieces by hand or jackhammer). The ore was dropped to crushers on

a



lower level, and then eventually to a shaft and out of the mine. We subsequently passed exhibits of drilling equipment, surveying, explosive storage and a fault zone.

We then entered the famous “Rainbow Room” (no, not the

(Sterling Hill Article Continued on Page 67)

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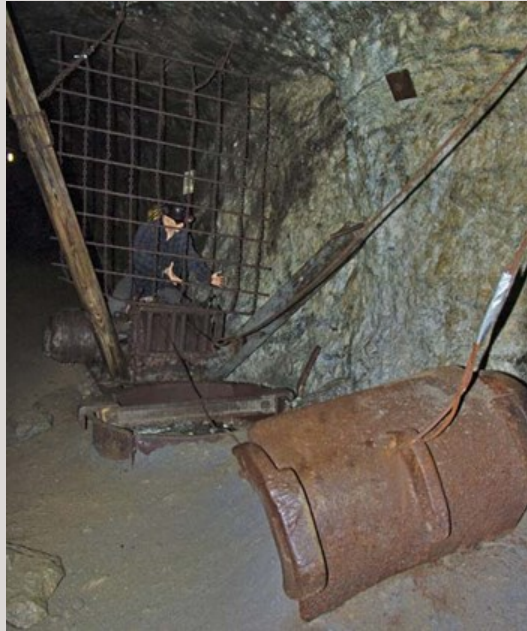


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(Sterling Hill Article continued from page 65)

lounge in NYC), where the actual zinc ore is exposed. Why “rainbow” – you guessed it - fluorescence. Under shortwave ultraviolet light, calcite is red (no zinc in it), willemite is green, barite is white, wollastonite is yellow and hydrozincite is blue. Looked like a 1960’s Peter Max poster.



After the Rainbow Room, we headed towards the exit, passing an explosives display, ore car and a slusher bucket (scrapes the ore). We made our way towards the Geotech Center located in an old mill just outside the mine. The center contains rooms for meetings and lectures, but also contains the Warren Museum of Fluorescence, which takes the Rainbow Room and turns it up a notch. The museum not only contains all sorts of natural fluorescent specimens, but also examples of man-made fluorescent items such as money – and – yourself! Well, that’s a pretty packed day, but we have only seen a portion of what is available at the Sterling Hill Mine. There is mineral

(Sterling Hill Article continued on page 69)

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(Sterling Hill Article continued from page 67)

collecting, including fossil and rock discovery centers, an astronomical observatory, historic mine structure, concession stand with a souvenir store and many outdoor displays (did I mention the steam engine?). Before you go, check out all the information on their very good website: <http://sterlinghillminingmuseum.org>, you'll need some planning! Oh, and yes, right up the road is the Franklin Mineral Museum, check out:



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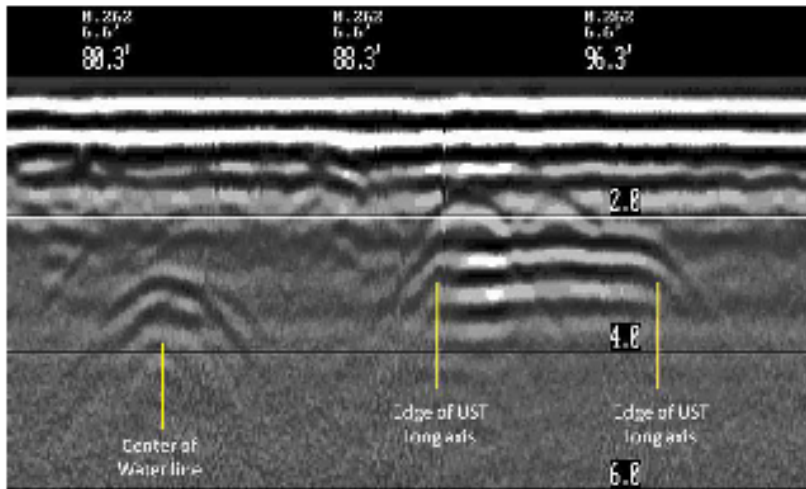


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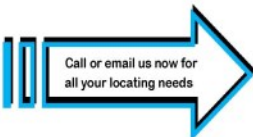
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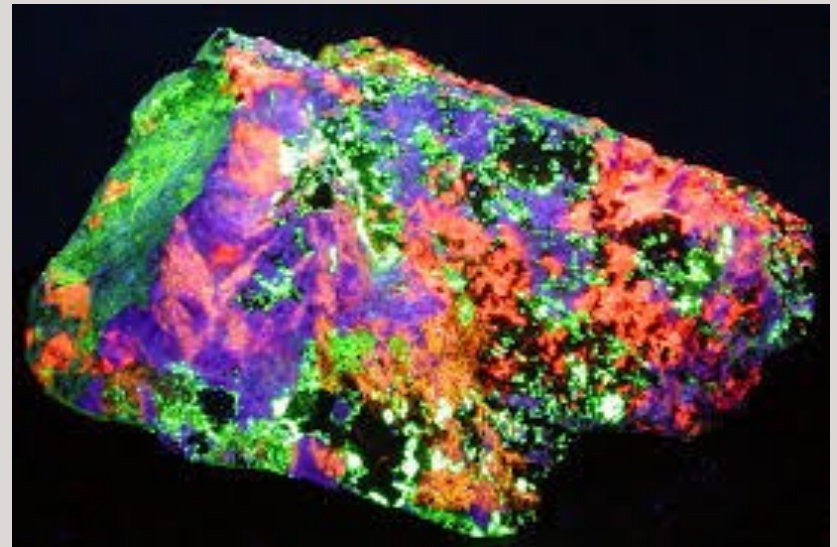
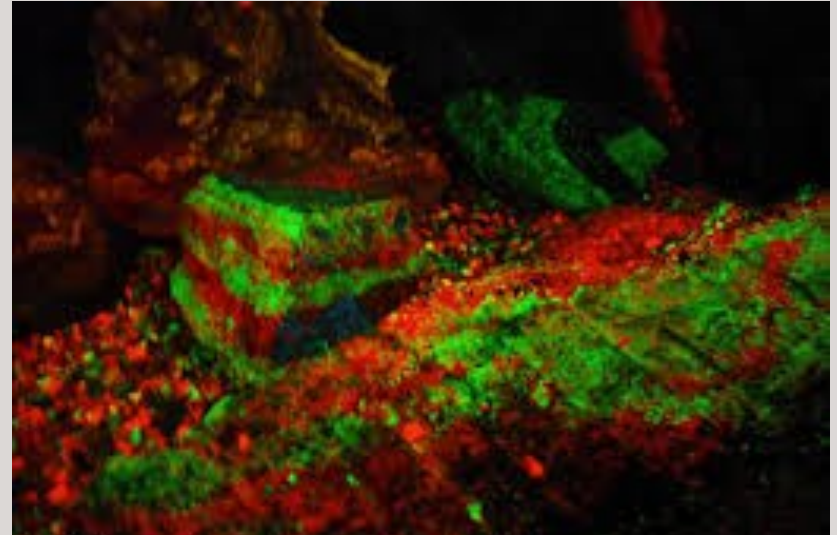
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NE/AIPG 2018 PUBLICATION SCHEDULE

Winter Newsletter

January 12 Deadline (Material to Editor)
January 26 Content to Publisher
February 12 E-mail to Members

Directory of Members

February 12 Deadline (Material to Editor)
March 16 Content to Publisher
April 16 E-mail to Members

Spring Newsletter

March 23 Deadline (Material to Editor)
April 6 Content to Publisher
April 23 E-mail to Members

Indian Summer Newsletter

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August 17 Content to Publisher
September 4 E-mail to Members

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Celebrating 32 Years of Scholarships!
The Angelo Tagliacozzo Memorial Geological Scholarship

The Angelo Tagliacozzo Memorial Geological Scholarship was established by the Northeast Section of the American Institute of Professional Geologists in late 1986. The first Scholarships were presented to undergraduate Geology students in 1987.

ATMGS recognizes the dedicated leadership and service which Angelo provided to NE/AIPG, to AIPG, and to the geological profession, until his untimely passing on October 11, 1986. The Scholarship furthers Angelo's goal of acquainting young geologists with AIPG and with AIPG's importance to the geological profession.

ANGELO TAGLIACOZZO (1936 - 1986)

Angelo Tagliacozzo received his doctorate in Geology from the University of Rome (Italy) in 1962. Thereafter, he worked in various positions as geologist, geophysicist, and hydrogeologist, which included assignments abroad, in the U.S., and with the United Nations. Angelo provided exemplary service to AIPG at the Section and National levels. He was a Northeast Section Executive Committee Member (1973-1982), Vice President (1977-1978), President (1979-1980), National Advisory Board Delegate (1981-1982), and Screening Board Chairman (1984-1986). Angelo's dedication to and leadership of the Northeast Section Screening Board has become the ultimate standard against which service in such a position is measured. Angelo also served as an AIPG National Executive Committeeman (1982); he was a vigorous advocate of measures to increase professionalism. Angelo was (and will be remembered as) a respected professional...and a friend.

THE SCHOLARSHIP

NE/AIPG grants Scholarships to undergraduate geology students annually. The Scholarships are designed to help with the cost of summer field courses, textbooks, and other aspects of geological education. Scholarships are awarded, both on academic achievement and on financial need, to students enrolled in recognized geology programs at colleges or universities in New England, New Jersey, & New York.

YOUR CONTRIBUTIONS

Your participation is encouraged in support of this dynamic memorial to Angelo and his recognition of the importance of AIPG to the geological profession. Contributions to the Scholarship Perpetual Trust Fund should be written to:

Angelo Tagliacozzo Memorial Geological Scholarship Trust Fund, and mailed to:

NE/AIPG Geological Scholarship Trust Fund
c/o Dennis McGrath, CPG
P.O. Box 472
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All Contributions are invested perpetually, with earnings thereon used solely for the Scholarship. NE/AIPG bears all costs of administration. Please ask your employer about Matching your contribution, and Additional corporate contributions.

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Memorandum

To: Dennis McGrath, Chairman, ATMG Scholarship, Northeast Section, AIPG

From:

Date:

Re: *I'm Taking the Pledge: I'M IN FOR 2018!*

Dear Dennis,

Just a quick note to let you know that I'm 100% with you when it comes to achieving the Section's goal of 100% participation in support of the Scholarship Perpetual Trust Fund during 2018, the 32nd Anniversary of the Scholarship! I agree with your encouragement that each and every Section Member make a contribution in accordance with their ability ... And this is the one time when I don't want to be the odd person out!

I'M IN FOR 2018!

For 2018, the 32nd Anniversary, I'm considering pledging ... Thirty Bucks A Week, Thirty Bucks A Month, or Thirty Bucks for the year!

Now, I know that it could be more ... And you know that it could be less! But I am committed to contributing as much as I can, so I'm not going to delay it any longer: ***I'M IN FOR 2018***

Yes, my personal budget is tight, but I figure that, somehow, I can set aside \$30 each month (aka the cost of a daily latte) this year to give back to the profession that has given me so much. And I just wanted to tell you that I am delighted to know that every one of those hard-earned dollars that I contribute will be INVESTED in the Scholarship Perpetual Trust Fund, so that my contribution today can keep on giving, year after year!

And that makes me feel like my contribution really means something, both now and in the long term! I have thought it over, and I know how important 100% participation is for Section pride! So, Dennis, ***I'M IN FOR 2018!***

Professionally yours,

Times are really (GREAT poor), so I am pledging:

____ 30 Bucks A Week (\$1560 for 2018)

____ 30 Bucks A Month (\$360 for 2018)

____ 30 Bucks A Year (\$30 for 2018)

Other: _____ (Every little bit is better than nothing!)

___ I'll make it easy on you; I have enclosed my check, made out to "Angelo Tagliacozzo Memorial Geological Scholarship Trust Fund".

___ Please invoice me for my 2018 pledge by 10/31/18. I'll pay by 12/1/18.

Signed: _____

Name Printed: _____

Address: _____

Mail this Pledge to: NE/AIPG Geological Scholarship Trust Fund, c/o Bob Blauvelt,
345 Stuyvesant Ave Lyndhurst, NJ 07071

- or -

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