

83rd Annual Field Conference of Pennsylvania Geologists
**TEMPORAL, TECTONIC, CLIMATIC AND ENVIRONMENTAL CONTEXT OF
THE TRIASSIC-JURASSIC RIFT SYSTEM OF EASTERN NORTH AMERICA:
EMERGING CONCEPTS FROM THE NEWARK RIFT BASIN**

Center Valley, PA

Thursday, October 4, 2018 – Preconference Trips & Registration

Friday and Saturday, October 5-6, 2018 – Field Trip

Trip Leaders

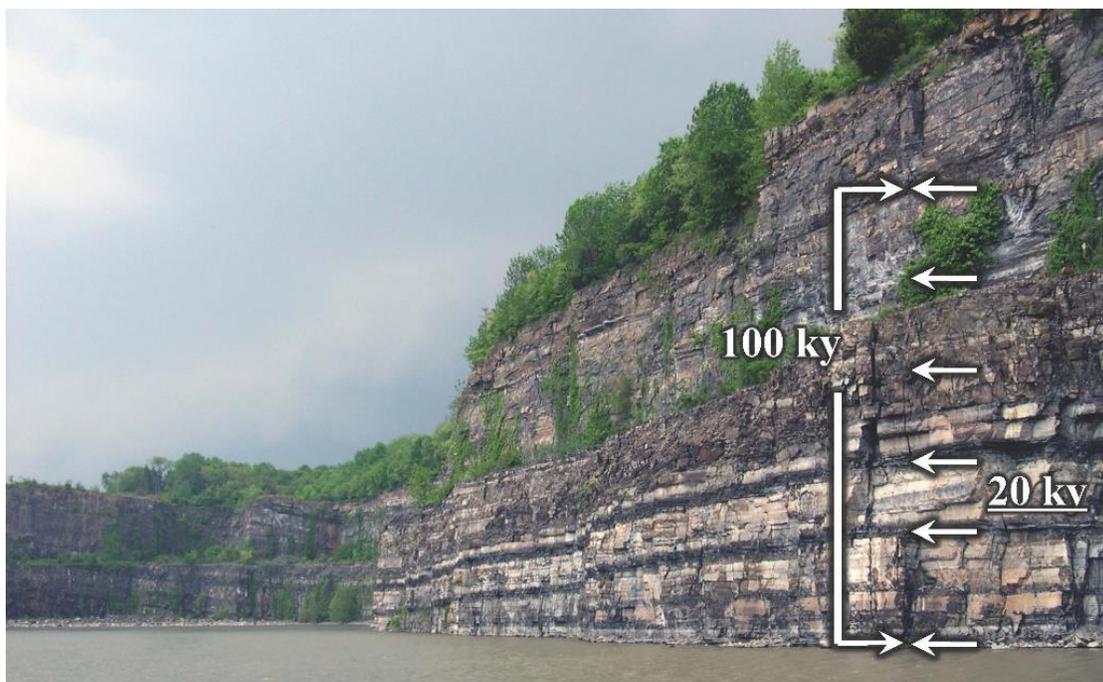
Paul Olsen, Lamont-Doherty Earth Observatory, Columbia University

Martha Withjack and Roy Schlische, Rutgers University

Frank Pazzaglia, Lehigh University

Headquarters

[Homewood Suites by Hilton](#), 3350 Center Valley Parkway, Center Valley, PA 18034
(610) 351-6400



Cyclic sedimentation in Lockatong Formation, Eureka Quarry

The Mesozoic Newark Basin stretches across southeastern Pennsylvania from the Delaware River to the northeastern tip of Lancaster County. This conference will focus on the basin in upper and central Bucks County where the sedimentary, igneous, metamorphic and tectonic history are well exposed in the local quarries. Topics to be discussed include the geometry and evolution of the basin, the distinct cyclic sedimentation related to climate history, and their relevance to environmental geology, groundwater and arsenic, and carbon sequestration. Additional stops will look at diabase related to Central Atlantic Magmatic Province ([CAMP](#)) and its associated contact metamorphism. Oddly, the Newark basin has never been the focus of a field conference and it is hoped that this trip will spur additional interest, studies and mapping in one of the more rapidly growing parts of the state.

A variety of preconference trips are also planned. Excursions include a tour of the nearby 19th century Ueberroth & Hartman Zn mines, a caving trip, a look at the Quakertown diabase sill, a geo-biking tour of the Saucon Rail Trail, and a groundwater remediation study in fractured bedrock at a former military base.

SCHEDULE OF EVENTS:

Thursday, October 4, 2018

- PRE-CONFERENCE FIELD TRIPS - Six preconference trips are planned. See descriptions below.
- CONFERENCE REGISTRATION - 4:00 PM - 10:00 PM – **Follow signs from main lobby**
- ORIENTATION AND RECEPTION - 7:00 PM - 10:00 PM – **Banquet Rooms**
Reception includes beer, hors d'oeuvres, rock swap, map blast, student posters, and silent auction.
- OVERVIEW OF FIELD TRIP - 8:00 PM – 9:00 PM – **Banquet Rooms**

Friday, October 5, 2018

- REGISTRATION - 6:00 AM - 7:20 AM - **Follow signs from main lobby**
- BREAKFAST – 6:00-7:15 **Banquet Rooms**
- FIELD TRIP - 7:30 AM - 5:30 PM - Buses depart from the back of Homewood Suites promptly at 7:30 AM. Lunch, doughnuts, fruit, coffee and other beverages will be provided.
- RECEPTION - 6:30 PM - 7:00 PM – **Banquet Rooms**. Hors d'oeuvres and cash bar will be available.
- ANNUAL BANQUET AND BUSINESS MEETING - 7:00 PM - 10:00 **Banquet Rooms**
Guest Speakers – L. Michael Kass, R. Damian Nance, Dr. Gerard P. Lennon on “Zinc Mining in the Lehigh Valley”
Elections for Chair and Vice-Chair will be held this year.

Saturday, October 6, 2018

- BREAKFAST – 6:00-7:15 **Banquet Rooms**
- FIELD TRIP - 7:30 AM - 5:30 PM - Buses depart from the back of Homewood Suits promptly at 7:30 AM. Lunch, doughnuts, fruit, coffee and other beverages will be provided.

ATTENDANCE - The number of conference attendees is limited to 170. If the attendance limit is reached, a waiting list will be developed. The Field Conference is intended for geologists, earth science teachers and students, including graduate students and undergraduates with a faculty recommendation. Please note, to encourage student participation, the Field Conference is offering a half-price registration scholarship. **Four** full scholarships are also available this year. Twenty student spaces will be held until September 15, then, if unfilled, will be released to the waiting list. Students should visit the student registration page at <http://fcopg.org/contact-us/students> for more information on scholarships or contact [Kristen Hand](#).

PROFESSIONAL DEVELOPMENT HOURS - Participants will receive a certificate of attendance. It will be your responsibility to track and report the number of professional development hours obtained based on the FCOPG agenda.

ROAD LOG & GUIDEBOOK – As in previous years, a printed road log will be included with registration. This year since the trip leaders have already published extensively on the Newark Basin a comprehensive guidebook will not be printed. Instead, articles and links will be listed on the field conference website.

IMPORTANT NOTES

TRANSPORTATION - Transportation is by bus only. **No private cars** are allowed since parking space and traffic control require that we limit the number of vehicles.

REGISTRATION- Registration is required for all conferees. To register, fill out and mail the registration form, the original, signed liability release form, and a check or money order for the registration fee, made payable to the “Field Conference of Pennsylvania Geologists.” OR fill out the form and send it electronically to RA-NRFCOPG@pa.gov and submit your payment via PayPal by visiting www.fcopg.org/.

Registrations will be accepted in the order they are received based on the postmark date of the envelope or the digital time stamp on the PayPal account.

A release and hold harmless waiver is required for this field conference. Failure to sign and return the waiver will result in the return of your registration without a reserved space. Additional waivers will be required by the quarry operators. These waivers will be signed at registration.

Since the great majority of the stops will be in quarries, you must bring a hard hat, boots and a high-visibility vest. The field conference will have extra vests for sale.

Registrations will be accepted only if accompanied by payment. *Reservations will NOT be accepted without payment.*

REFUND POLICY - If you need to cancel before September 15th, 2018, a full refund will be given. If you cancel after that date, refunds will be given only if your space can be filled. Usually it can be.

ACCOMODATIONS

Lodging: [Homewood Suites by Hilton](#), 3350 Center Valley Parkway, Center Valley, PA 18034 (610) 351-6400. A block of 75 rooms has been reserved at the rate of \$102+tax/night. The rooms will be held until Sept 13. **When making your reservation, be sure to indicate that you are with Field Conference of PA Geologists – Group Code PAG.** Rooms may be cancelled with a full refund up to 48 hours before arrival. If the Homewood Suites is full, there is a Springhill Suites less than a mile away and numerous other motels and hotels within several miles.

Buses will pick up attendees at the Homewood Suites. Commuters may park at the hotel for the day.

Preconference Field Trips, October 4, 2018

Only contact the leaders if you have questions, otherwise sign up with the registration form!

Ueberroth and Hartman Zinc Mines (free)

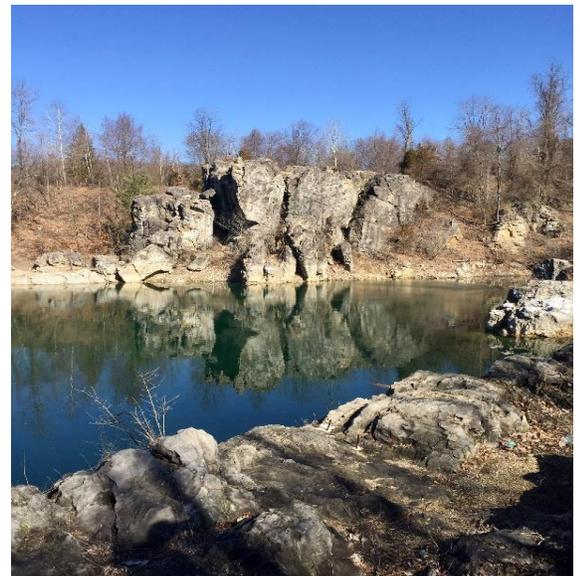
Leaders: R. Damian Nance, L. Michael Kass, Gerard (Jerry) Lennon and Mark Connor, mwconnar@aol.com

Limit: 2 tours, 10 attendees each tour

Exertion Level: Easy

Attire: boots, long pants and bug repellent recommended; walking stick might be helpful in a few locations.

The purpose of this field trip is to acquaint participants with the Hartman and Ueberroth mine pits (water filled) which are located on the corner of Center Valley Parkway and Old Bethlehem Pike. These mines were active in the 19th century and remnants of the mining activity are visible throughout the property, most notably, the four standing walls and pump shaft pit of the Cornish style engine house at the Ueberroth Mine. This engine house once supported the largest stationary single cylinder engine ever constructed. The host rock is a Lower Ordovician Rickenbach Formation, a silty, medium-dark-gray, crystalline dolomite, which comprises the base of the Beekmantown Group. Exposed mine workings show vertical bedding, underground drifts following selected veins, and white secondary sulfate incrustations. In the early years of mine operations, an average recovery of 40% Zn was obtained from the oxidized ore was obtained and, later, 20% Zn. The major mineral to be observed is sphalerite with minor and trace observations of hemimorphite, greenockite, bianchite, goslarite, smithsonite, sauconite and hydrozincite.



The Friedensville zinc mines will be the presentation topic at Friday night's banquet dinner.

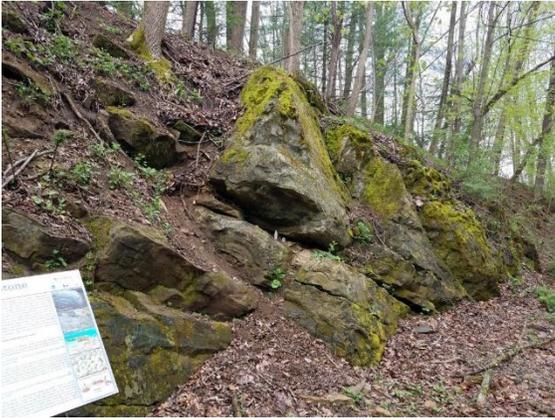
We will meet at 12:30 PM (Tour 1) at the parking lot of Homewood Suites which is within a mile of the gate entrance to the Ueberroth Mine location. At the mine site, there is room for a few cars within the gate, but carpooling from the Homewood Suites is encouraged. The tour will last approximately 1.5 to 2.0 hours. At 3:00 PM (Tour 2) will begin starting again at the Homewood Suite parking lot. Since the property is owned by Lehigh University and is unimproved and posted for "no trespassing", each participant will be required to sign a waiver at the commencement of the tour.

Geo-Biking Tour of the Saucon Valley along the Saucon Valley Rail Trail

Leaders: Frank J. Pazzaglia, fjp3@lehigh.edu, (610) 217-4523

Limit: 10 minimum, 30 maximum

Exertion Level: Modest difficulty, ~30 km (18 miles) geo-biking tour on mostly flat, hard, pea-gravel surface.



The 2018 field conference will be based in the Saucon Valley, giving participants an opportunity to tour the rocks and structures of this part of the Pennsylvania's Blue Ridge and Newark Basin that are exposed along the newly-opened Saucon Rail Trail (<http://sauconrailtrail.org/>) and South Bethlehem Greenway (<http://pahighlands.org/?section=south-bethlehem-greenway-3>). This pre-trip will be an ~30 km (18 miles) geo-biking tour on mostly flat, hard, pea-gravel surface starting and ending at Upper Saucon Park in Upper Saucon Township, just two miles from the conference hotel. The tour would cover Grenville rocks of the Blue Ridge, the Great Unconformity, Cambrian sedimentary rocks, and Newark basin sedimentary and igneous rocks. Stops will include excellent exposures of stromatolites and wave ripples, CAMP diabase and hornfels, and redbeds at the Coopersburg dinosaur footprint site. We will also do a ground water / hydrology stop at the springs in Saucon Park. We will access the trail from Upper Saucon Park and bike north to Saucon Park in Bethlehem, then turn around and head south to Hellertown to Water Street Park for a catered lunch, then continue south past Upper Saucon Park to Coopersburg to see the Mesozoic rocks. At that point, we will return north to Upper Saucon Park, and then the Conference Center. The tour will last from 10:30 AM through about 4:00 PM. Attendees are encouraged to provide their own bike, but bikes can also be rented from Saucon Valley Bikes on Thursday morning, (see instructions below).

Meet at Upper Saucon Park, 3231 Preston Lane, Center Valley, PA, 18034 (<https://www.uploadsaucon.org/parks-and-recreation/park-facilities/>). The trip will start at 10:30 and return y 4:00. A catered lunch – pizza, drink and fruit will cost \$10 per person. Please pay the Field Conference for lunch. Attendees must provide their own transportation to and from Upper Saucon Park

Other requirements: Bring (or rent) a bike. A standard, basic mountain bike or commuting bike or comfort bike will be fine. Road bikes are OK, but there are some bumpy sections that may post a challenge for a road bike. To rent a bike locally, contact Saucon Valley Bikes (<https://www.sauconvalleybikes.com/services/svbikes-rentals/>). Prices will range from \$15-\$50. They recommend Giant Sedona bikes for riding the rail-trail. Bike rentals the day of the trip must take place at or before 10:00 AM so that participants can get to Upper Saucon Park in time for departure. More information will be provided to participants who need to rent bikes in the weeks leading up to the trip.

Quakertown Diabase Intrusion, Salford Township, Montgomery County (free)

Leader: [Robert Kulp](#)

Limit: 15 attendees,

Exertion Level: Easy to moderate, less than one mile walking but some hills and boulder fields. Boots or walking shoes needed. Hammer use is restricted since some land protected by Natural Lands Trust.



This trip will study the textural and mineralogical variations ranging from olivine and orthopyroxene dominated diabase to late stage syenite pods exhibited in the differentiation of the Quakertown diabase sill. Igneous layering is locally developed.

Meet at 12:30 at Homewood Suites. Because parking is limited at the site, carpooling at the hotel may be helpful.

Contaminants in Fractured Sedimentary Rock: USGS Hydrogeology Research at the Former Naval Air Warfare Center, West Trenton, New Jersey, Locketong and Stockton Formations (free)

Leaders: [Alex Fiore](#), Daniel Goode, Thomas Imbrigiotta, and Pierre Lacombe (retired); U.S. Geological Survey

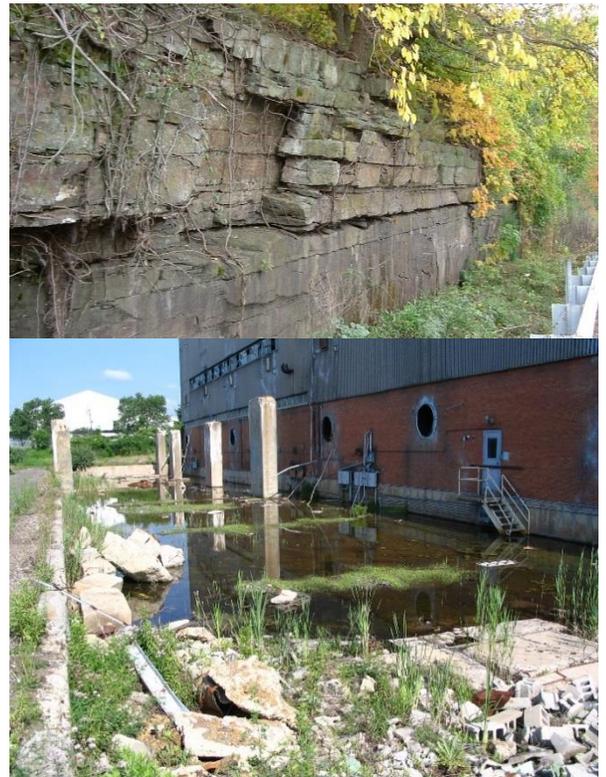
Limit: 20 people

Exertion Level: Easy

Attire: High visibility vests/clothing are recommended

Fractured bedrock is considered one of the most challenging settings for groundwater contaminant remediation owing to the inherently large degree of aquifer heterogeneity. Thousands of contaminated sites are present in fractured Newark Basin sedimentary rock aquifers in New Jersey and Pennsylvania. The Naval Air Warfare Center (NAWC), in West Trenton NJ, is a former military facility where trichloroethylene (TCE) and per- and polyfluoroalkyl substances (PFAS) entered the groundwater from 1953 through 1990. The NAWC overlies fractured mudstones of the Locketong Formation and fractured sandstones of the Stockton Formation. Research addressing the hydrological, geochemical, and microbiological processes affecting contaminant migration and natural attenuation in fractured bedrock has been ongoing at NAWC since 1992 by governmental, academic, and industry scientists, creating a well-defined natural laboratory with an extensive database focusing on the site hydrogeologic framework and the long-term monitoring of water levels and water quality data.

This field trip to the NAWC will emphasize the development of the high-resolution hydrogeologic framework and its application to the multifaceted research conducted at the site. We will examine a road cut and cores to learn about the geology underlying the site, then



tour the various research areas, including (but not limited to) biostimulation, biotic and abiotic degradation, adsorption and desorption, thermal conductive heating, surface and borehole hydrogeophysics, passive flux meter, and hydraulic and electrical tomography experiments. For more information, visit <https://nj.usgs.gov/nawc/>

Meeting place and time to be determined. Total time 3-4 hours. Contact [Alex Fiore](#) for more information.

Lehigh Underground (\$15 fee for cave admission)

Leader: [Rose-Anna Behr](#)

Limit: 10 attendees

Exertion Level: Moderate to more than moderate. Potentially rough terrain, you will get wet, you will get muddy.



We are still working on the details and permissions, but plan to visit both a commercial and a non-commercial cave. The Lehigh Valley region hosts some tectonically much-improved carbonates of Cambrian age including the Leithsville Dolostone which hosts Lost River Caverns. The other commercial possibility is Crystal Cave near Kutztown which is located in the limestone of the Ordovician Hamburg sequence. A potential expedition to a nearby private cave is being arranged.

Meeting location and time to be determined. Rose-Anna will contact you with details when the trip locations are confirmed. Travel will be by personal auto.

Please bring a lunch, water and a change of clothes. Please dress appropriately since the cave temperature is in the low 50s year-round. The private cave will be wet and muddy and require boots, a helmet and a lamp. Some caving gear will be available to borrow if you inform the leader ahead of time.

Important Items

- 1. Registration and waiver forms are available digitally and can be submitted by email. If printing, print the waiver form on the backside of the registration form to reduce paper waste. (p. 8-9)**
- 2. We now accept credit cards via PayPal. Visit www.fcopg.org.**
- 3. You will receive an email indicating your registration has been accepted or you have been placed on the waiting list. Student spaces will be held until September 15, then if unfilled, released to the waiting list. Emails will be sent out every Monday. Please be patient.**
- 4. Please sign the Field Conference waiver. Quarries will have additional waivers that must be signed at registration.**
- 5. Hard hats, boots and high-visibility vests are required this year.**
- 6. For PA State employees who plan to have their registration paid by the state, our Federal ID # is 25-1592474. Our SAP Vendor #151625.**

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 Center Valley, PA, October 4-6, 2018**

Registrations will be accepted in the order received, based on postmark or PayPal timestamp. Registration includes bus transportation, printed road log, digital download of entire guidebook, FCOPG doohickey, evening reception, two lunches, banquet dinner, sugary dough product, fruit, coffee, and beverages. Registration must be accompanied by payment. You must sign the waiver as explained on page 7 of the announcement, Important Items.

NAME _____ PHONE NUMBER _____

STREET _____

CITY _____ STATE _____ ZIP _____

Please check one: Home address Business address

NAME & AFFILIATION (for badge) _____

E-mail _____ Cell _____

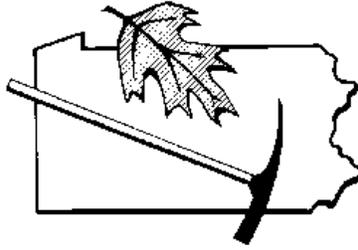
Registration \$260/ Student registration \$130	
PRE-CONFERENCE TRIPS: Indicate first and second choice.	
Ueberroth and Hartman Zinc Mines Tour - 12:30 (free) Ueberroth and Hartman Zinc Mines Tour 2 - 3:00 (free) Geo-Biking Tour of the Saucon Valley Rail Trail (\$10 lunch, bike rental separate) Quakertown Diabase Intrusion, County (free) Lehigh Underground (~\$15 fee for cave entrance, pay onsite)) Contaminants in Fractured Sedimentary Rock (free)	
Donation to Student Scholarship Funds	\$
Donations to General Field Conference Funds, beer fund, etc.	\$
Dietary Restrictions-	
Total:	\$

Make checks payable to

FIELD CONFERENCE OF PENNSYLVANIA GEOLOGISTS, Inc,
 3240 Schoolhouse Road
 Middletown, PA 17057-3534

Signature acknowledging that you have read and accept the conditions on the page entitled "Important Items." Your registration will be rejected if it is not signed.

Signature: _____



FIELD CONFERENCE OF PENNSYLVANIA GEOLOGISTS, INC
RELEASE AND HOLD HARMLESS WAIVER

The undersigned, having been fully advised as to the nature and possible dangers and hazards of the field trip ***TEMPORAL, TECTONIC, CLIMATIC AND ENVIRONMENTAL CONTEXT OF THE TRIASSIC-JURASSIC RIFT SYSTEM OF EASTERN NORTH AMERICA: EMERGING CONCEPTS FROM THE NEWARK RIFT BASIN***
Center Valley, PA, October 4-6, 2018,

which are sponsored by the Field Conference of Pennsylvania Geologists, Inc., does hereby assume any and all risks involved in connection with the trip, and does hereby save and hold harmless, the ***FIELD CONFERENCE OF PENNSYLVANIA GEOLOGISTS, INC., ITS OFFICERS, REPRESENTATIVES, AGENTS, OR MEMBERS, and LANDOWNERS*** from any and all claims, losses, and damages (including attorney's fees and any other costs involved because of said claims) on account of injury, death, property damage, or inconvenience or loss of money due to any delay that may arise, by reason of my participation. I understand that my use of alcohol or drugs would impair my judgment and coordination, and will hold the above stated organizations and individuals harmless from claims arising from the use of either. I understand that I am solely responsible for carrying my own life and health insurance.

SIGNATURE _____

PRINTED NAME _____

DATE _____

THIS FORM MUST BE RETURNED WITH YOUR REGISTRATION FORM