



Friends of Thacher State Park

Emma T Thacher Nature Center • 87 Nature Center Way • Voorheesville, NY 12186
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Some Basics on Geology and Paleontology, and the Rocks and Fossils of Thacher Park

Dr. Chuck Ver Straeten, New York State Museum

Some Geology Basics, Mostly About Sedimentary Rocks

Rocks and minerals are naturally formed solid substances. For example, quartz is a mineral; a solid mass of sand grains made of the mineral quartz, when cemented together, forms a rock sandstone; or more specifically, a quartz sandstone. Similarly, a rock with visible crystals of the minerals of quartz, feldspars, and sometimes other minerals is termed granite.

The rocks in Thacher Park are sedimentary rocks. Not igneous (molten earth material that cooled to rock) or metamorphic (rocks that have been exposed and altered to other rocks under elevated pressures and/or temperatures).

Sedimentary rocks begin (mostly) as loose sediments which become cemented together. Cement sand together and you get sandstone; cement pebbles together, you get conglomerate; cement whole seashells, broken shells, or shells ground down to salt or flour size particles together and you get limestone. "Mud", made of microscopic "clay" minerals, becomes the rock called shale. (some mud has silt, sand, shells, etc. mixed into it).

Some less common sedimentary rocks form by chemical means – think of dissolving some salt (NaCl) with water in a shallow platter, and letting it dry out; it forms crystals of salt (halite) again.

Fossils and Paleontology

Fossils are the remains or traces of activity of living organisms. Most remains of living organisms break down and/or decay. Think of a clam. It has a shell and soft tissues. When it dies, the soft tissues may be fed on, and/or decay. What is left is a shell. But over time, most shells are broken or even ground up into powder. Ground up? Think of a shell on a sandy beach where waves wash sand over it constantly. Shells can be broken or worn away by sand washing over them with time. They may also be dissolved in somewhat acidic water.

Likewise, the bones, teeth and flesh of a vertebrate animal, including us, are rarely preserved for the fossil record.

Most every bit of remains of living organisms never fossilize. Only a minute fraction of all living organisms throughout Earth's history is preserved.

Fossils are a key element in determining the ancient environment that a set of sedimentary rocks formed in.

Ancient Environments in Thacher's rocks

Sedimentary rocks, which started as loose sediment, settled on the surface in some ancient environment. Some on land, some in rivers and lakes, some in the seas and oceans.

In the case of Thacher Park, all of the rocks here settled out in "shallow" seas. Sometimes those seas covered eastern New York and extended down to the Virginias. At other times, they extended west beyond the modern Mississippi River (of course, there was no Mississippi River back then).

When you finally go down on the Indian Ladder Trail in the Spring, the lower rocks in the cliff will have certain features that tell us about the environment at Thacher in the deep geologic past. Limestone, often light gray in color, has very visible, thin layers but in some places may be odd chaotic-looking blobby masses. There are also mud cracks. Very few fossils can be found here (and odd fossils they are).

In the upper part of the Indian Ladder Cliff, the rocks will have a distinctly different character. It is very hard to see layering in those rocks – they break off as huge blocks, visible along the trail. Their color is a bit darker, perhaps a bit of a somewhat darkish gray; and you can see fossils scattered in them including corals, brachiopods (brack'-ee-oh-podz) and other fossils.

Even the rocks in the Indian Ladder Cliff have different characters. That is because they were deposited in different ancient environments. The lower rocks in the cliff were deposited along the shore of our "shallow sea", in tidal environments, where the tides flow in and out daily. In

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contrast, the rocks in the upper part of the cliff, which are also limestones, formed in deeper water – where waves were crashing minute by minute, day by day. You’d likely want to bring a surfboard with you if you jumped into a time machine set to when these rocks were deposited.

That’s only two of the major sets of rocks (called “formations”) in Thacher Park. There are additional different ancient environments, where different types of marine life lived and thrived in the park.

Some additional points to add...

I wrote of “shallow” seas. These seas were flooding onto the North American (and other continents) in the deep geological past – these were not oceanic depths. Maximum depths, only reached sometimes, would have been a couple to few hundred feet deep. The deepest water rocks in the park are found in the higher elevations, south of Beaver Dam Road.

When I say the deep geologic past, I mean old. From about 450 million years ago to about 390 million years ago. That’s about 60 million years of time. That’s much older than when dinosaurs first appear in the rocks on Earth. The first dinosaur fossils are about 230 million years old; the dinosaurs died off about 65 million years ago. Even 450 million years is only a fraction of Earth’s history, which goes back to about 4.5 billion years ago. Those oldest rocks in the park, in the valley below the Indian Ladder Cliffs, at ~450 million years old, are only about 1/10 of the age of the Earth. Thinking about time at this scale was part of what drove me back to school for geology at age 30.

The layers in the rocks you’ll see in Thacher Park will generally appear to be laid out flat, like the pages of a book laying on a table. But in some places, they’ll appear bent and folded, even broken up. We call those feature “folds” and “faults”. After the sedimentary layers became rock, they were “deformed.” We’ll learn some more about them; but one key fact – those rocks were folded and faulted during earthquakes, in the deep geologic past.


(A note about the “flat”-lying layers in the park. They’re really more like a book that has a nickel or something under one side, so that the pages are slightly tilted to the south-southwest).

There are caves in Thacher Park. These and other related features, called “karst”, form because limestone slowly dissolves away from contact with weak, natural acids in waters and soil. Besides caves, other karst features have names like sinkholes, clints and grikes, ... Many springs in the park represent where the bottom of limestone layers overlies rock types that don’t dissolve, like shale and sandstone.

One of the other big geology stories about Thacher Park, which helped form the landscape here, is that around 24,000 years ago (a drop in the bucket compared to the rocks) – the park was covered by about a mile’s thickness of glacial ice.

Finally, “How to Become a Fossil”

Finally, a small but significant point, paleo-wise: If you want to become a fossil, the most important first step is to be buried soon after death, in sediments. Much affects your becoming a fossil (or not) after that, but that’s the key first step.



Connecting people to nature one stop at a time!
Nature Bus
Powered by CDTA

Friends support the Nature Bus for its second year

Last year the Friends supported the pilot year of operation of the “Nature Bus” program run by the Mohawk Hudson Land Conservancy (MHLC) and the Capital District Transportation Authority (CDTA). The program ran buses to natural areas in the capital district including Thacher Park on weekends. The primary objective of the program was to provide no-cost access to natural areas for people who don’t have easy access to cars. Nearly 1,000 people took advantage of this service last year. With some program changes and increased publicity, the hopes are for an increase in use of the service this year.

Friends of Thacher have had a long commitment to providing access, especially to children. This is why we set up a program to provide school buses to Thacher Park for children from schools who could not afford school trips. This concept proved extremely popular with our members who contributed generously and the children were very enthusiastic to learn all about nature. The State adopted this idea and eventually provided statewide funding.

MHLC and CDTA ran a survey to gather public input and refine the services for this year. Based on public input the program has been improved through decreased ride times, adding new places and providing more programming at each site. Based on the Friends’ commitment to increase access and the proposed improvements in the Nature Bus program, the Board of Friends of Thacher have committed \$1,500 to the program on behalf of the Friends organization. While the Board strongly supports this program, we have made it clear that this year’s commitment is not a promise of future commitments. MHLC fully understands and is working to establish an on-going revenue stream for the program.

The program began on May 28th and the routes can be found at <https://tinyurl.com/2kuwj9c>. If you would like to make an individual contribution to the program go to the MHLC website at mohawkhudson.org.

- by Betsey Miller

Welcome to the new Assistant Park Manager!

Hello, my name is **Carley Kiernan** and I am the new Assistant Park Manager at Thacher State Park. I hail originally from the Mid-Hudson Valley. My hobbies include stand up paddle-boarding, making handmade jewelry and wood crafts, and collecting gemstone and mineral specimens. I was born and raised in the City of Newburgh, which is known as a very large, diverse, and sometimes dangerous city. During my youth, as I viewed my overdeveloped and littered surroundings, it was clear to me that I needed to be closer and actively involved in the natural environment. My father would take me on trips to nearby Minnewaska State Park, Mohonk Preserve, and boating on the Hudson River. It was these trips that solidified my bond with nature and my father, a sentiment that inspired me to continue my education in the environmental field. I cannot stress enough the importance of parents bonding with their children over nature and outdoor recreation.

I attended SUNY Cobleskill for Outdoor Sports Area Management and Fisheries & Wildlife. Upon returning home, I began working as a seasonal employee at Minnewaska State Park. I was very determined to work my way to a more influential position in the state park system from a very young age. I knew that you had to follow the opportunities as they came and so I also took positions working at the Purple Heart Hall of Honor and Trailside Museum & Zoo. These jobs gave me more skills and experience in the outdoor field, which led to acquiring a permanent position as a Maintenance Supervisor at FDR State Park in the Taconic Region. During my tenure in state parks, I was very dedicated to learning all of the hands on skills I possibly could, and took advantage of all available training and certification opportunities. I spent time operating all of the power equipment on site, became certified in Game of Logging, earned my CDL license, became a Certified Pool Operator, coordinated with the local friends group and disc golf course association, and supervised seasonal staff.

An opportunity came along to work with the non-profit land trust, Scenic Hudson and I left NYSOPRHP to work with them as the Parks & Trails Coordinator. During my tenure with Scenic Hudson, I spent time coordinating multiple trail and park improvement projects with contractors and partner organizations. I supervised the field staff and we managed over 20 different parks and properties spread throughout 9 counties. Over the years, I worked to enhance their maintenance facility, procure new vehicles and equipment essential for working safely and efficiently, and created guidelines and protocols to managing their

properties. I worked in partnership with the Student Conservation Association to supervise and mentor a Parks & Trails Assistant Intern annually, for 12 consecutive years. During this time I was able to utilize all of the skills and trainings I had learned from working hands-on in my career. I was also able to gain experience that varied from my duties in state parks, and delved into work such as: contracting, budgeting, staff management, capital project management, trail design and building, assisting in new park planning, and coordinating with volunteers. During this time my title was promoted to Parks and Trails Manager.

I have now come full circle back to NYSOPRHP. When the opportunity to become Assistant Manager at Thacher presented itself, it felt like it was meant to be, so my family and I packed up and headed for the Saratoga/Capital Region! My husband, myself, and our 5 year old, Mallory, are really looking forward to exploring the area, becoming part of the community, and making new friends! We are excited for what the future holds for us here and I look forward to meeting all of you!

Introducing the new Nature Center Director!



I'm **Becky Schneider**. I studied Natural History and Interpretation at the SUNY College of Environmental Science and Forestry where I discovered the importance of connecting people to the natural world around them. After graduating I worked for NYS Parks on Long Island as an Environmental Educator and Piping Plover Steward.

There I had the opportunity to study plant and animal populations, and share with people the ways that they can protect and support local habitats. I then moved to the Ecuadorian Amazon for 5 years where I taught English and conservation, and began a reforestation initiative with Two Rivers Reserve. I am excited to start this next chapter at the Emma Treadwell Thacher Nature Center where I can share my love of the natural world, and living sustainably.

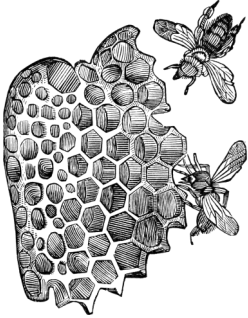
As always, call (518) 872-0800 or (518) 872-1237 to verify program activity times and dates.

Many thanks to Dr. Chuck Ver Straeten, Betsey Miller, Carley Kiernan, Becky Schneider, Savannah Wilson and Marina Dreeben for their contributions to this newsletter.

Christine Gervasi—Editor (cgervasi@albany.edu)

Friends of Thacher Park Meeting dates are Wednesdays, July 13, September 14, and November 9.
7:00 PM at Thacher Visitor Center. Come join us! (Masks may be required)

Friends of Thacher Park
c/o Emma Treadwell Thacher Nature Center
87 Nature Center Way
Voorheesville, New York 12186-2601



<https://etc.usf.edu/clipart/>

Wednesday July 13, 2022

Next:

Board Meeting

7:00 PM at Thacher Visitor Center (masks may be required)

The Honeybees are Back!

Emma Treadwell Thacher Nature Center has been home to a honeybee colony for many years, one of our many shining gems that delight visitors of all ages. In 2021, our honeybee colony was invaded by small hive beetles, a hive pest that originated from sub-Saharan Africa. Sadly, the honeybee colony collapsed in a few short weeks, due to the beetles fermenting the honey and eating the wax around bee eggs.



Thankfully, we were able to acquire a new hive from Mickle Hollow Maple and Honey in June of 2022. Dean, the farm owner, escorted the new nucleus colony, also known as a "nuc", to the Nature Center and installed the colony into their new home! (photo)



Our new Queen, a large female with a yellow-marked dot on her thorax, is settling in nicely. She's examining her new blank frames and mapping out where her thousands of future eggs will be laid. The yellow mark is an international symbol stating the year she emerged from her case, 2022. There are 5 recognized colors that rotate through the years: blue, white, yellow, red and green

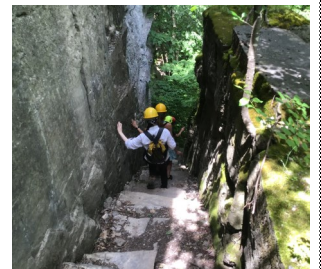
A few fun bee facts: The average honeybee will only make less than 1/10th of a teaspoon of honey in its lifetime! To

make just one pound of honey, bee foragers must collect nectar from approximately 2 million flowers and fly over 55,000 miles during nectar collection! In one day, the Queen bee can lay up to 2,000 eggs!

- by Savannah Wilson

Thacher Climbing Coalition Open House

On Saturday June 11th, the Nature Center teamed up with Thacher Climbing Coalition for an open house paired with a guided tour of the climbing area. The event attracted local rock climbers who had the opportunity to learn more about the unique climbing at Thacher, as well as park patrons with no climbing experience.



During the guided hike, participants made their way through Helm's Crevice, a narrow crack in a ground at the entrance to the climbing area. Most park visitors do not know that we have a climbing area, and the area is generally only open to climbers with permits, so this walk provided a rare opportunity for visitors to see the area. Bill Ottoway from the Thacher Climbing Coalition explained the logistics of outdoor climbing as well as the history and geology of the climbing area here at Thacher. I am looking forward to maintaining our partnership with the Climbing Coalition, and hopefully offering more opportunities for visitors to see the climbing area in the future!

- by Marina Dreeben

As always, you can find a color version of the newsletter at www.friendsofthacherpark.org