GeoConnections©

It's Summer! Time for a Field Trip!

Poly-metamorphism and poly-deformation of Bronson Hill Rocks, Northeastern Connecticut

Join Dr. Robert Wintsch for an exciting trip into the Paleozoic rocks of the Bronson Hill area on June 25, 2011.

Dr. Wintsch of Indiana University fascinated over 75 GSC members with his talk on the tectonic history of the Paleozoic terranes in eastern Connecticut at the Fall 2010 GSC meeting held at Wesleyan University. Now you have the opportunity to learn about Bob's work at the actual localities where he conducted his work. These unique rocks hold the secrets of how continental plates merge during collisions.

The field trip will commence at Dinosaur State Park 8am Saturday June 25 and return at 5 pm for our famous post-trip "*Rockin' Burgers 'n Beer*"!

See form on page 3 of this issue, or go to our web site for details.

From the Presidents Desk

Wow! What a year and a half it has been! We have seen a whirlwind of activity, beginning with the inaugural meeting of the Geological Society of Connecticut at Dinosaur State Park in October 2009. The very successful Fall meeting was attended by more than 100 eager geo-enthusiasts. The first Spring field trip in May 2010 was an exciting trip to the Tilcon traprock quarry, the Portland brownstone quarry, and Dinosaur State Park. Our Fall 2010 Annual meeting, held at Wesleyan University featured fine food and geological companionship, complimented by an excellent talk about the metamorphic rocks of eastern Connecticut by Dr. Robert Wintsch. We are now gearing up for our Spring 2011 field trip to look at some of these outcrops in the Bronson Hill terrane. Share in the excitement and join us for the second Spring field trip on June 25! Also, please don't forget to renew your membership by sending your 2011 dues payment today.

~Janet R. Stone

MEETING REPORT: 2nd Annual Fall Meeting, October 4, 2010

Invited Speaker: Dr. Robert Wintsch, Indiana University

"*Deciphering the past from the present: The Late Paleozoic tectonic evolution of eastern New England revealed in the metamorphic rocks of eastern Connecticut*"

Robert Wintsch explained that the work presented is the culmination of decades of collaborative investigation, including efforts of Mick Kunk, J. Aleinikoff, Greg Walsh, Mike Dorais, John Rodgers, Roberta Dixon, Richard Goldsmith, Larry Lundgren, and Mike Pease.

The presentation started with a diagram of global scale, delineating the primary tectonic plates, associated with the Eastern margin of the late Paleozoic in what is now North America.

The question posed was *How Do You Thicken the Crust during Orogenic events*? Wintsch proceeded to use geologic and geophysical data from Newfoundland, compared to geologic data from southern New England to support identification of the Gander Terrane, the Eastern part of which has been de-laminated by the approach of the Avalonian Plate prior to the Alleghanian Orogeny. This concept produces what has been shown in seismic data captured by the Canadian and US. Geological Surveys, as an interwoven cross section of Gander and Avalonian Terranes.

The model is supported by marine seismic data collected by the USGS to the south, making a convincing argument that detailed geologic quadrangle mapping can be best interpreted from a regional perspective. Compilation of work gathered over broad geographic areas incorporating a variety of investigative techniques, including geophysics and geochemistry/geochronology, produces a coherent story of tectonic reconstruction.

Watch the video of Bob's lecture on YouTube:
http://www.youtube.com/watch?v=AgFbpnWyUck

THE TREASURER'S REPORT

Starting a new non-profit organization is a learning experience for the entire Board. Drafting the Society's Constitution and By-Laws, setting up accounts, and filing with the IRS are only a few of the myriad tasks that we tackled. We still have work to do before we are recognized as a non-profit organization. Mr. John Purtill of Purtill and Associates of Cheshire donated a great deal of time and effort to help get us incorporated, determine our IRS status, and file the necessary paperwork. The Society should, in my opinion, establish a "Golden Rock-hammer Award" and make John its first recipient!

Table 1 (below) presents a summary of our financial activity to date. Essentially we take in dues, have a couple of office expenses and run events that are designed to break even (which, on average, we have done). As such, we should run a surplus every year. Our recurring expenses are not great. Office expenses are about $400/yr (rental of post office box is $60, annual renewal of our registrations internet host expenses will be about $250) and that's it.

The surplus will provide funds to cover over-runs at any of our sponsored events, provide funds for "scholarships and other endowments" referred to in Art. VI of the Society's Constitution, and cover any up-front expenses associated with possible publication activity referred to in Art. IX of the Society By-Laws. Essentially the surplus will be used to fulfill our mission. We are still in the process of defining how we plan to best use it.

Please feel free to contact me (rsteinen@gmail.com) or any Board Member with comments or suggestions.

-Randy Steinen

Year	Income	Expenses	Bal + (-)
2009-2010	9,135	5,296	3,839
2010-2011*	4,640	3,764	876
*on 5/16/11			4,715

MEMBERSHIP COMMITTEE

Once we advertised the newly-formed GSC in 2009, over 140 members poured in from private industry, academia and state and federal departments, rapidly filling our ranks. We currently have 181 members, many of whom have already renewed for the 2011-2012 membership year.

We also have over 15 student members and are looking for even more students to help us with programs and events!

Your fees support the society and its programs, build awareness of geology in Connecticut, and allow us to plan even more exciting special events!

If you are not a member, please join us. If you are a former member, please come back. If you are a current member THANK YOU and please remember to renew!

-Matte Thomas

This Just In...

From the Communications Committee

We are pleased to present our first issue of *GeoConnections: New and Views From the Geological Society of Connecticut.*

We will be reporting on our activities, events, and exciting developments in this newsletter. We welcome your short submissions of items of interest to our geoscience community. We plan on adding many new features in the months to come!

Our web site has been our main means of communicating with our members and the world at large since 2009. We recently migrated to a new server that will provide even more on-line features for our members including PayPal for electronic payment of dues and event fees, a feedback page, on-line balloting, and more!

Visit us at: http://www.geologicalsocietyofconnecticut.org

~Peter LeTourneau

FOCUS ON: DINOSAUR STATE PARK

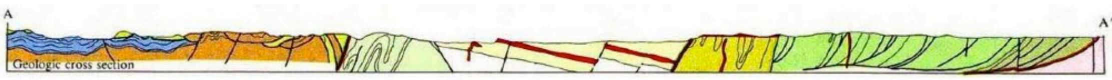
Did you know that the Connecticut Valley is one of the most important localities for numerous tracks and trackways dating from the early Age of Dinosaurs? Left in soft mud and sand and preserved for nearly 200 million years, the tracks reveal the activities and size and shape of both quadrupedal and bipedal dinosaurs at a time when Connecticut was a sub-tropical paradise for these unique creatures.

The tracks shown here, called Eubrontes were left along an ancient lake shore by an early relative of T. Rex! You can see these tracks and more at Dinosaur State Park on West Street in Rocky Hill, Connecticut. Follow signs from Exit 23 on I-91. Visit http://www.dinosaurstatepark.org/ for hours and special events. You can even make a plaster cast of a large track to bring home! See you there!

HOW TO CONTACT US:

Email: info@geologicalsocietyofconnecticut.org

Mail: P.O. Box 59, Storrs, CT 06268



GEOLOGICAL SOCIETY OF CONNECTICUT

Poly-Metamorphism and Poly-Deformation of Bronson Hill Rocks,
Northeastern Connecticut *led by Dr. Robert Wintsch*

Second Fieldtrip Meeting

June 25, 2011

The second fieldtrip sponsored by the Geological Society of Connecticut will be held on Saturday, June 25, 2011. The fieldtrip will assemble at 8:00 AM at **Dinosaur State Park** in Rocky Hill, CT. We will consolidate into as few cars/vans as possible for the fieldtrip. Stops are all in the towns of Vernon, Tolland, Bolton, Coventry, and Manchester. The trip will return to Dinosaur State Park by about 5:00 pm, and the day will culminate at the Park with a social gathering featuring “Burgers and Beer.” Fieldtrip transportation is by personal vehicles; **car pooling is encouraged**. Directions to the assembly point and STOP 1 will be emailed to you once you have registered. The fieldtrip may qualify for continuing education credit for PGs, LSPs, and LEPs pending approval by the LEP Board and the LSP Board.

The number of fieldtrip participants will be limited, so **register early**. Registration is permitted for GSC Members only, so if you are not a member, you must also fill out a membership form found on our website http://www.geologicalsocietyofconnecticut.org and remit the $20 membership fee; if you have not paid your membership dues for this year, you must do so before registering for the fieldtrip. Cost for the fieldtrip is $25 ($15 for Student members) which includes the guidebook and park entrance fee. Cost is $15 for the optional Burgers and Beer social event following the fieldtrip. If you can’t make the fieldtrip, consider joining us for the post-trip gathering. We need a final count of attendees by June 17. Please register for this meeting **before June 17** by sending the signed registration form below and the appropriate fees to:

Geological Society of Connecticut, P.O. Box 59, Storrs CT 06268

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Please register me for the “Poly-Metamorphism and Poly-Deformation of Bronson Hill Rocks, Northeastern Connecticut Fieldtrip” sponsored by the Geological Society of Connecticut to be held on June 25, 2011.
I enclose my registration fee:

Member $25.00__________ Student Member $15.00__________
Burgers and Beer $15.00__________

Name: ____

Email address: ____

Accident Waiver and Release of Liability:

I hereby assume all risks of participating in this activity. I waive, release, and discharge from any and all liability and do indemnify and hold harmless the Geological Society of Connecticut and any of its directors or members, Burgundy Hill Quarry, and Dinosaur State Park. This release is for any and all liability for personal injuries and property losses or damages occasioned by or in connection with any activities or locations of this event.

Signature_______________________________________ Date ________________________

MINI-GUIDE: BLUFF POINT STATE PARK

There is no better place to spend a pleasant summer day than in one of Connecticut's fabulous state parks. Found in all corners of the state, the units of the park system all feature noteworthy ecology and geology. Bluff Head, located on the coast in Groton, is of our favorites! This mini guide will help you appreciate the natural treasures found close to home. Let's go outdoors and have some fun! -Ed.

Bluff Point State Park and Coastal Reserve occupies a peninsula projecting into Long Island Sound. It is bounded by the Poquonock River on the west, Mumford Cove on the east and Fishers Island Sound on the south. Within the park landforms vary from beach to marsh, to brackish lake, to wooded uplands. Both surficial and bedrock geology can be studied here.

Rock Types Found Along the Trail

- Hope Valley Alaskite Gneiss: light pink and gray medium and coarse grained granitic gneiss (Precambrian age)
- Mamacoke Formation: light and dark gray medium grained gneiss (Precambrian age)
- New London Gneiss: gray granitic gneiss (Precambrian age)

Minerals of Interest

- Quartz, potassium feldspar, and mica in the bedrock
- Layers of pink garnet sand may be found on the beach

Interesting Geologic Features

- Headland cliffs
- Drumlin shaped hill
- Recessional moraine
- Spit beach
- Sand dunes
- Salt Marsh
- Lagoon/tidal estuary

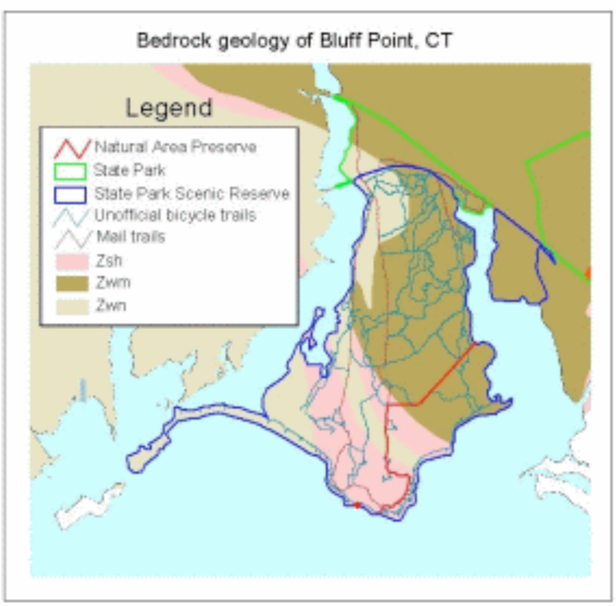

Figure 1. Bedrock geology of Bluff Point.
Zsh - Hope Valley Alaskite Gneiss,
Zwm - Mamacoke Formation,
Zwn - New London Gneiss
(Source: Rodgers, John, Bedrock Geological Map of Connecticut, CT Geological and Natural History Survey, 1985)

Geologic History of Bluff Point:

Glaciers covered all of Connecticut on at least two occasions, leaving behind deposits of sorted and unsorted silt to boulder-sized sediments. Since the last ice left Bluff Point about 17,500 years ago, water has been moving around much of the debris left behind. The beach is made up of a combination of sand- to gravel-sized particles left behind by the glaciers and others eroded from the rocks making up the bluffs. The waves and wind also sort the grains by size. Where waves are larger, pebbles may be deposited and the smaller grains removed. Smaller waves and the wind will deposit sand. In some areas, the beach contains areas of red or black sand. The red sand contains garnet, and the black sand contains magnetite. Take a magnet to the beach and you can collect magnetite, as it will cling to your magnet!

Sand at Bluff Point generally moves from east to west. The beach would probably extend over to the airport area if the Poquonock River did not move the sand out into the Sound. At one time the beach did extend to Bushy Point, but the 1938 hurricane breached the beach, separating it from what is now Bushy Point Island, at least at high tide. The beach is now a spit. When it was connected to the island it was a tombolo.

Most of the beach rises away from the Sound to small sand dunes piled up by the wind, stabilized by grasses and other plants. These help to keep waves from washing into the small pond and marsh behind the dunes. The plants are necessary to keep the dune sands in place, so please cross the dunes only on the boardwalks.

MINI-GUIDE...continued.

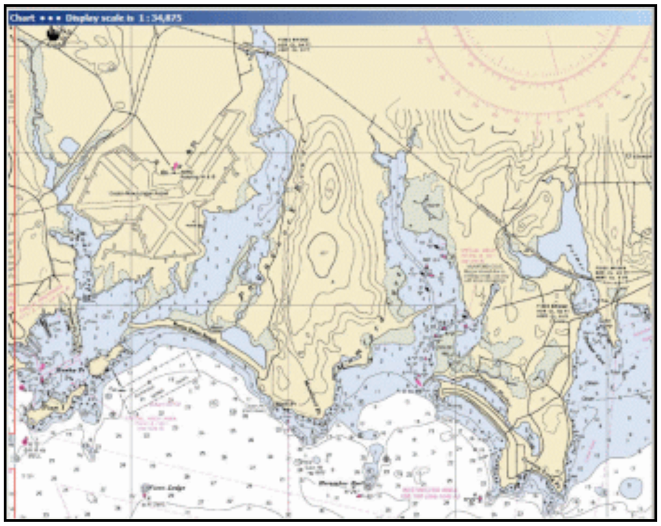

Figure 2. Chart of Long Island Sound off of Bluff Point, showing water depth in feet.

Sand at Bluff Point generally moves from east to west. The beach would probably extend over to the airport area if the Poquonock River did not move the sand out into the Sound. At one time the beach did extend to Bushy Point, but the 1938 hurricane breached the beach, separating it from what is now Bushy Point Island, at least at high tide. The beach is now a spit. When it was connected to the island it was a tombolo.

The shape and width of the beach varies due to storms and seasons, as well as tides. Winter storms tend to bring higher waves than summer ones and carry away more sand. These larger waves tend to carry away the finer materials, making the beach coarser. They also steepen the beach.

Most of the beach rises away from the Sound to small sand dunes piled up by the wind, stabilized by grasses and other plants. These help to keep waves from washing into the small pond and marsh behind the dunes. The plants are necessary to keep the dune sands in place, so please cross the dunes only on the boardwalks.

After you have explored the beach, walk east toward the cliffs. You will notice that the beach turns to boulders as you reach the east end (Figure 3). The black "stains" on them are a type of algae. Most of these boulders have eroded off the cliff due to wave action. Not only do the waves crash against the cliff rocks, but water freezes in cracks, expanding to push the rocks apart. Even salt water that evaporates in the cracks expands as the salt crystals grow. Chemical weathering also occurs, as some minerals such as feldspar gradually weather to clay minerals. Over time the rocks break up.

Figure 3. The rocks at the east end of the beach. These rocks broke off the cliffs and were moved by waves. If you look at the rocks carefully, you will find they are mostly the same kind of rock and match the bedrock found on around the point to the east.

From the beach, the main trail climbs the bluff for spectacular views of the Sound with Fishers Island in the distance. Because the bluff here is covered with sediments, it is difficult to see the bedrock. But when the trail heads inland, if you take one of the smaller trails down to the beach, you will see that this point is all bedrock (Figure 4).

Figure 4. Gray and pink-banded Hope Valley Alaskite Gneiss. The 600 to 700 million-year-old rock contains mainly plagioclase feldspar, quartz and minor amounts of magnetite (the source for the magnetite sand), biotite and muscovite. All of the bedrock at Bluff Point is about this same age; although, it does not have the same chemical, and thus mineral, composition.

MINI-GUIDE…continued.

This same rock makes up an outcrop you passed in the woods if you followed the lower trail to the beach, but there it is covered with lichens, so is difficult to see. Here the salt water keeps lichens from growing on the rocks, yet does not cover them often enough for the dark algae to grow on them.

The lichen-free rocks present an opportunity to study changes within a metamorphic rock. This rock has undergone high temperature and pressure changes since the rock originally formed, allowing the mineral crystals to grow in new orientations and size, without ever melting. Metamorphism requires a very long time. Follow some of the bands and see how they curve. In many places there are veins of one or more minerals cutting through the rock (Figure 5). There is at least one old fault exposed, a place where the rock broke and moved (Figure 6).

Figure 5. A vein of pink feldspar and white quartz cuts across other layers. Black and white layers above the backpack are folded.

Figure 6. Movement has occurred along this break, offsetting the gray layer at the top of the boulder. That makes this a fault.

Split Rock is the large, split boulder sitting on top of the nearly flat surface (Figure 7). It was probably moved to its present location by the glaciers, but since it is the same rock type as the rock it sits on, it is not considered to be a glacial erratic.

Figure 7. Split Rock. According to old stories, one very cold night during the winter of 1779 - 80 the rock split with a loud sound like a cannon shot.

Walk up the cliff to the main trail/road. Follow it into the woods back toward the parking lot. Turn left at the sign for "Sunset Rock". This is probably an erratic, as it seems to be a different rock type than should be in this area, although the lichens make it difficult to be sure without breaking off a piece (please don't). The rock got its name from the sunset views that used to be visible from here when this area was covered with cottages instead of trees.

Return to the main trail and continue toward the parking lot. As you walk through the forest you will see boulders here and there. These were left behind by the glaciers that once covered all of New England. As they slowly moved south, loose soil, sand, gravel, and boulders were frozen into the ice. When the ice eventually melted, that material was left behind. In valleys, water moved the sediments around, sorting them by the action of the moving water. As a result, sand and gravel deposits are found in valleys and till, a mixture of materials just sitting where it dropped, covers the hills in New England.

As you start walking from the shore back toward your car, you are walking through till. Notice the red areas on Figure 8, representing glacial moraine. There the front of the glacier, where most of the melting was occurring, was stationary for some period of time because the glacier continued moving southward as fast as it was melting. A large amount of debris was left here as the ice melted.

MINI-GUIDE...continued.

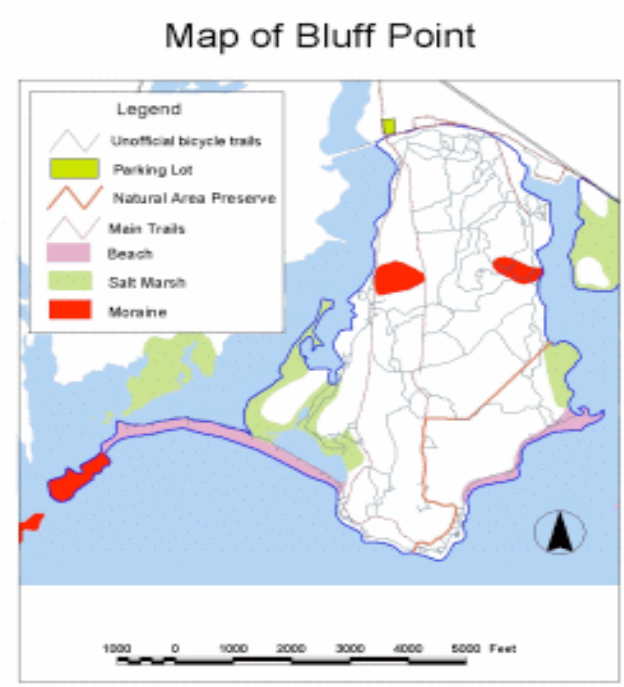

Figure 8. Bluff Point map of surficial materials, the materials left behind by the glaciers (except for the modern beach) (*Stone et al., Surficial Materials Map of Connecticut, USGS, 1992)*

The moraine is identified by a heavier concentration of large boulders in the woods, especially between the two main trails, more than half-way back to the parking lot after leaving the southernmost end of the point. You also pass through the moraine on your way to the beach along the water trail, but the vegetation usually obstructs the view.

Another rock unit, the Mamacoke Formation, can be seen along the trail which heads east from the parking lot, in front of the restrooms. Follow the main trail until you see outcrop in the woods south of the trail. This gray rock is also metamorphic and gneiss, but has indistinct layering in most places. Its major minerals are plagioclase, quartz and biotite, but in some areas it also contains minor amounts of sillimanite, garnet, hornblende and microcline. Some outcrops also contain layers of quartzite, which is mostly quartz, and amphibolite, which is mostly amphibole.

Sources: This article is adapted from the *Geology of Connecticut State Parks* by Nancy McHone, Connecticut Geological Survey, Department of Environmental Protection. Modified for *GeoConnections* by Camille Fontanella, DEP Bureau of Water Protection and Land Reuse-Remediation. For info on this and other state parks visit: http://www.ct.gov/dep/cwp/view.asp?a=2716&q=398432&depNav_GID=1650

More Fun at Bluff Point State Park...EarthCaching!

The CT Geological Survey has published two *EarthCaches* written about processes occurring on the beach that might also be of interest:

http://www.geocaching.com/seek/cache_details.aspx?wp=GC180GX The Changing Beach at Bushy Point Part I
http://www.geocaching.com/seek/cache_details.aspx?wp=GC18V9D The Changing Beach at Bluff Point State Park, Part II

Geo-quiz: *Where in Connecticut?*

Can you identify this interesting geological feature?

Tell us where it is located, its significance, and the approximate age of the rocks! Bonus: who is in the picture?

Put your answer in the contest box at our *Rockin' Burgers 'n Beer* following the June 25 field trip or email us at info@geologicalsocietyofconnecticut.org.

The first correct answer drawn at random from the contest box will win a special geological prize!

RESEARCH CORNER

Laser Scanning Research at Dinosaur State Park

James A. (Drew) Hyatt

Recently, a team of researchers from Eastern Connecticut State University began mapping and imaging the micro topography of the main track way at Dinosaur State Park in Rocky Hill, CT. This ongoing project makes use of terrestrial laser scanning (TLS) techniques and has involved Environmental Earth Science undergraduate students Kristina Cedrone, Ian McCary, and Lindsey Belliveau (Figure 1). Our first objective is to prepare a detailed image-map of the track way that should be available for use in educational programing at the Park later this summer. Scanner data will also pave the way for future research collaborations analyzing the 3-dimensional form of trace fossils at the site. The following provides a brief description of LIDAR/ TLS technology and an overview of our efforts at the park thus far.

Figure 1. (a) View of the Trimble VX Spatial station at one of 4 survey positions around the main track way at Dinosaur State Park. Approximately 385,000 survey points have been collected from the site. (b) Eastern EES students Kristina Cedrone, Lindsey Belliveau and Ian McCary (left to right) collecting pole imagery of the track way. Pole images will be used to texture the 3-dimensional computer model of the site.

Light Detection and Ranging (LIDAR) technologies, whether ground-based or airborne, are a rapidly evolving collection of high resolution surveying techniques that support dramatic improvements in visualization and analysis of 3-dimensional geologic features at a variety of scales. Interested readers will find excellent overviews of data acquisition, analysis, and application in the 2009 "*Laser Scanning for the Environmental Sciences"* edited volume by G.L. Heritage and A.R.G. Large and published by Wiley-Blackwell (ISBN: 978-1-4051-5717-9). Much of the following summary draws from this source. Aircraft -based LIDAR combines rapid laser distance measurements with precise GPS positioning and high-frequency inertial orientation corrections. Scanning rates are high such that the collection of raw survey points, referred to as a point cloud, for airborne LIDAR typically yields ≈ 10 points per m^2 over large areas. Point cloud data can include reflections (called returns) from many line-of-sight targets such as trees, buildings, and of course the ground. It is often assumed that the last return represents the ground surface. As such, with substantial data processing, a bare earth model can be generated from LIDAR data yielding digital elevation models that are of much higher quality than previously available. Although LIDAR and TLS can be rapid and accurate, the instruments themselves are very expensive, and significant training is required to master the acquisition and processing of raw data. Fortunately free airborne LIDAR data (processed and raw) are available for all of Connecticut from the Connecticut Land Use and Education (CLEAR, http://clear.uconn.edu/) website. Organized by town and quad number these and other data sets are readily integrated within GIS projects and are easily used to create high resolution hill shade models, topographic maps, and other visualizations.

Ground-based TLS is very new, having evolved over the past decade. In general, TLS point cloud data sets are more dense, they focus on smaller target areas, and they are collected at closer ranges than is the case for airborne LIDAR. Interest in and use of TLS data by the geoscience community is increasing. For example, the 2010 national Geological Society of America meeting held multiple concurrent sessions dedicated to the use of LIDAR and TLS that included 51 presentations and a TLS short course (see technical sessions T32, T125, P6 and short course 512 in the 2010 Denver GSA searchable abstracts). An important aspect of TLS data acquisition is the ability to integrate high-speed surveying with high-density spatially registered imagery. As such, some scanners collect 4 or 5 attributes for each survey point, including x, y, and z coordinates, RGB color, and laser return intensity. For the newest scanners, these data are being collected at rates of 50,000 points per second or more!

RESEARCH CORNER...continued.

The truly mind-boggling aspect of these developments is that they are now being integrated with moving ground-based platforms and 3-dimensional printing and manufacturing technologies. For example, just last week I was able to view a new hand-held scanner that collected and built sub-mm resolution 3D models of small targets in real time. I understand through conversations with scanner representatives that car-mounted systems are under development ... something that promises to take Google street-view to a whole new level. Moreover, scanned data sets in combination with new 3-dimensional printers are opening doors to new types of manufacturing that can also be applied to geological topics. As an illustration, paleontological presentations by Hasiotis, Hirmas, Platt and Reynolds at the most recent Northeastern/North-Central GSA meeting in Pittsburgh (search paper 20-4 in the on-line abstracts volume) described use of scanning and rapid prototyping (3D printing) to investigate trace fossils at sites in Africa and to build educational models that enabled K-16 students to examine replicas that would normally be difficult and costly to share with students.

We have recently begun to scan the Dinosaur State Park track way using a Trimble VX spatial station (Figure 1). The VX is a highly versatile laser surveying instrument that operates in several modes ranging from a conventional prism-based and prismless total station, through a robotic total station with wireless access, to a 3D scanner. This versatility has tremendous educational value enabling one to introduce undergraduate students to a variety of surveying techniques on a single instrument. However, the tradeoff for this versatility is a slower speed of scanning. In fact, unlike dedicated scanners that utilize rotating mirrors to spray scan pulses, the VX simply re-sites each target when scanning a point cloud. As a result the top speed for the VX is ≈ 15 points per second, meaning that it takes a bit longer to collect dense point clouds. That said, to date we have completed 3 days of scanning and have collected approximately 385,000 survey points on the main track way which works out to an average spacing between points of ≈ 2 to 3 cm. Since scanning is line-of-sight surveying, it has been necessary to use more than one instrument position to fill in shadow zones inside some of the tracks. In order to establish the new instrument position within the same spatial coordinate system ≈10 reference points on the surrounding mural have been surveyed. These reference positions were then used as resection points when setting up a new instrument position. Once leveled and resected the VX transmits a live video-feed of its field of view to a hand held TSC2 controller. Scanning limits are then outlined on the TSC2 touch screen, spatially registered digital images are collected, a survey grid is defined, and scanning begins. Subsequent data processing using proprietary software segments and cleans the survey point cloud after which a triangulated integrated network (TIN) mesh is created. This mesh is further processed to fill holes, smooth peaks, and remove aberrations. Imagery collected by the VX can then be used to texture the mesh surface yielding a photorealistic 3D model (Figure 2).

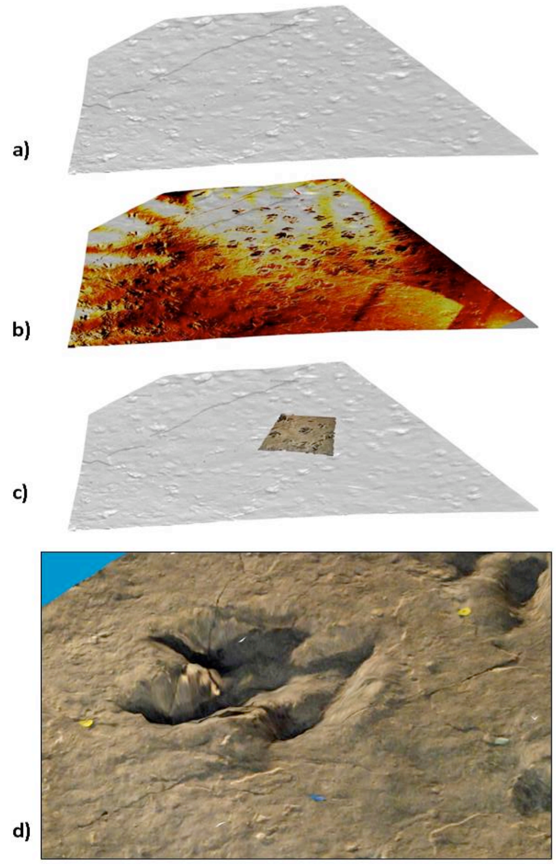

Figure 2. Images depicting (a) a preliminary computer mesh model of a portion of the track way based on a ≈90,000 point cloud data set. The final point cloud includes ≈385,000 survey points. (b) The same mesh textured with VX images which are not properly exposed for ambient light conditions. VX images may be replaced with (c,d) higher quality digital SLR images by registering new images in the survey space. The net effect is to produce a 3D mesh that is textured with high quality images. Yellow dots in (d) are 2 cm in diameter.

Interestingly, one of the most challenging aspects of this project has been the collection of high-quality imagery. The overall low-light conditions in the DSP dome combined with bright side-lighting around the track way and the low viewing angle of the VX creates a challenging scene to photograph. To get around this problem we first use the on-board VX camera to collect overlapping but relatively poorly exposed reference images (Figure 2b). In addition to this VX imagery, we also collected >200 near-vertical and overlapping images of the track collected using a 22 foot tall pole-mounted Nikon D60 camera (Figure 3 and 4).

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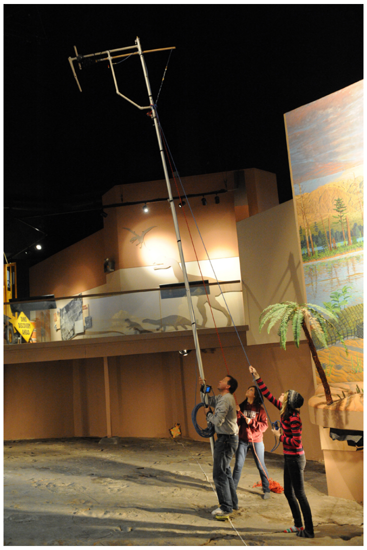

These higher quality pole images will be registered into VX survey space by identifying common locations in both the pole images and the original VX model. In this way the TIN mesh will be retextured with the higher quality images. Once completed the textured model will be exported as a rectified photo-map for display as page-sized or wall-sized base maps for use in educational programs at the park.

Although this project has really just begun, we anticipate providing the park with large and small rectified maps of the track way by the end of the summer. Research on the topographic characteristics of individual tracks is at an early stage and would benefit from collaboration with others who specialize in form analysis of paleontological trace fossils, as I am a geomorphologist by training.

Contact:

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Figure 3. (Top) Near-vertical images were collected using a 22 foot tall pole platform with sufficient overlap to remove the photographer from image mosaics (see Figure 4, next page). (Bottom) High resolution versions of these images will be registered into the proper survey space and used to texture computer meshes models of the track way (see Figure 2). Yellow dots are 2 cm in diameter.

RESEARCH CORNER...continued.

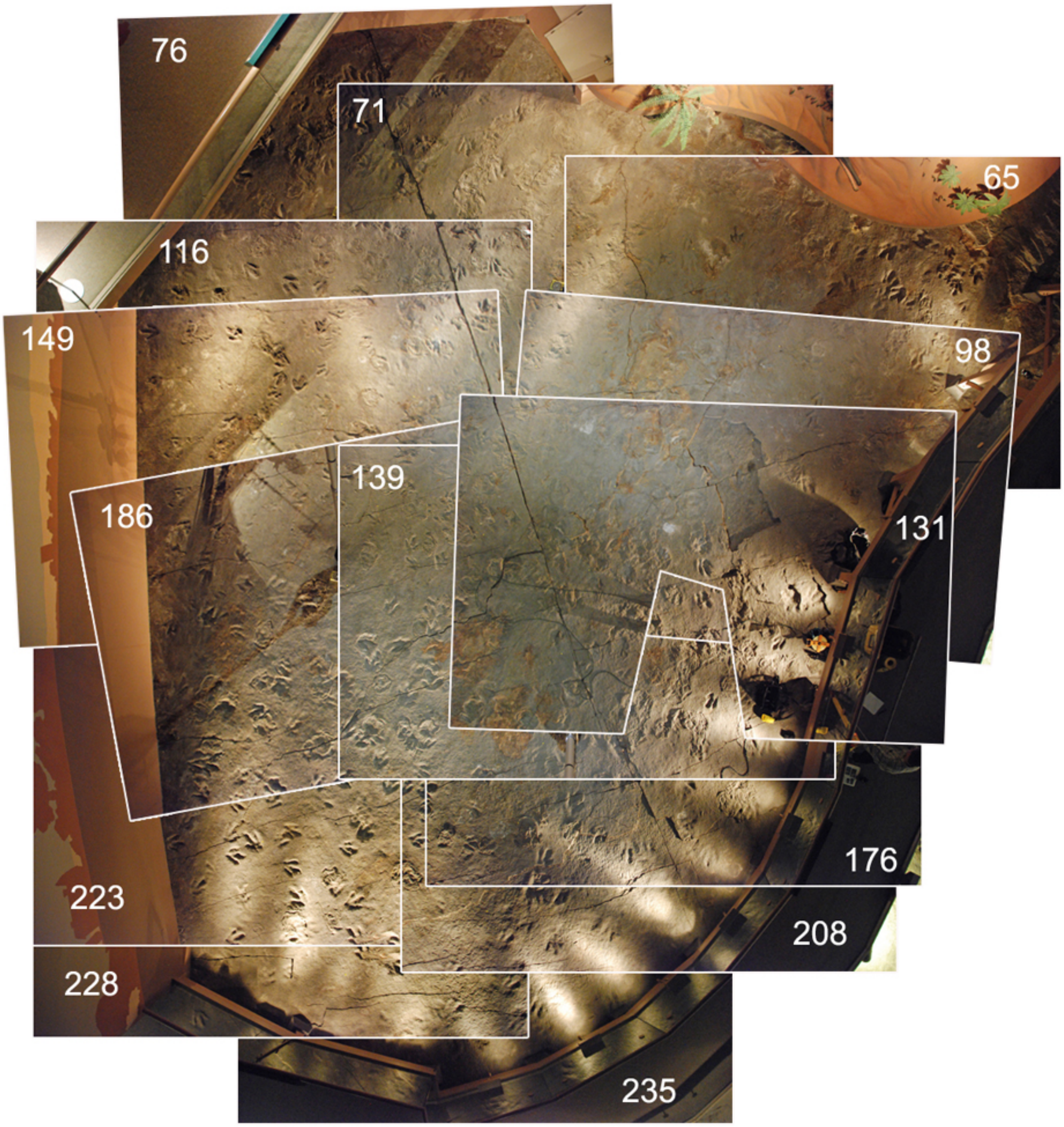


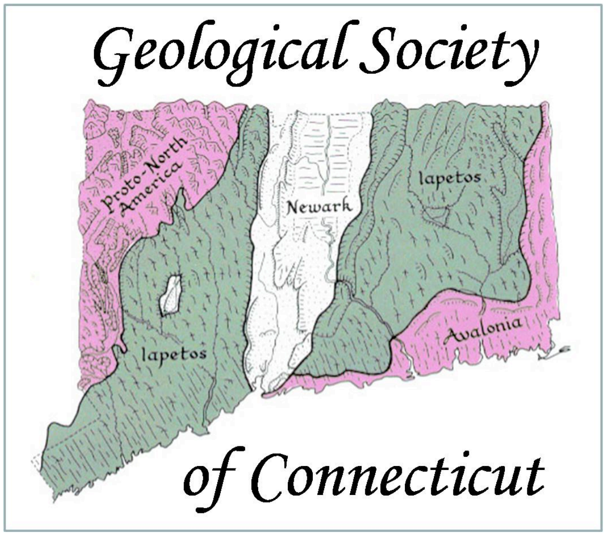
Figure 4. High resolution photo mosaic produced using the pole mounted platform. Portions of these images will replace VX imagery in the final 3D model. Numbers in white refer to image index.

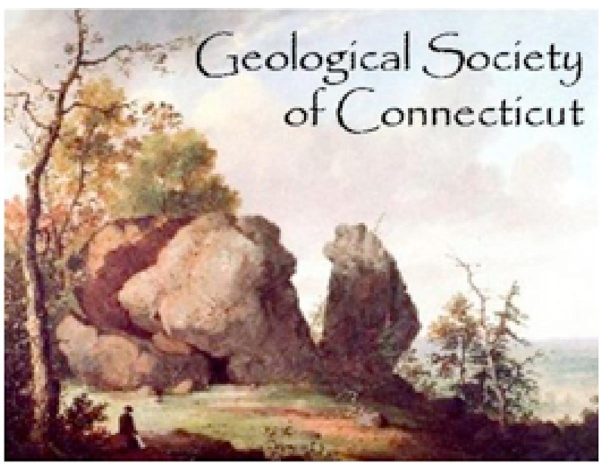
GeoConnections welcomes short submissions about research in aspects of Connecticut geoscience.
Use the current *Research Corner* article as a guideline for format.
Please submit your articles for consideration to: info@geologicalsocietyofconnecticut.org

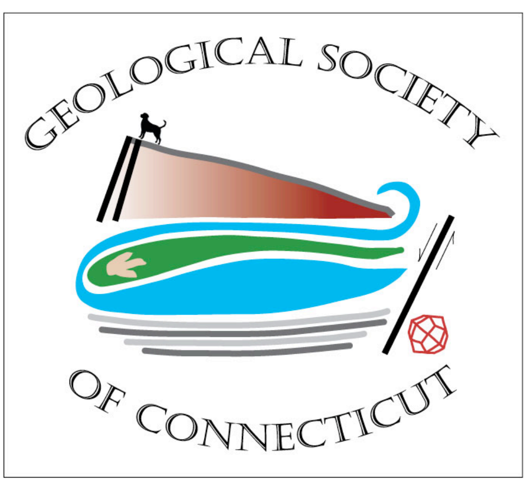
GSC LOGO CONTEST

GSC NEEDS A LOGO !

We have received 3 logo submissions so far. Try your hand at creating one and either email it to info@geologicalsocietyofconnecticut.org or bring it to the *Rockin' Burger's 'n Beer* event on June 25. Winner of the logo contest will receive a free membership for next year.







Calendar

June 25, 2011

GSC 2nd Annual Field Trip

Meet: Dinosaur State Park, Rocky Hill

Fall 2011

GSC 3rd Annual Fall Meeting

Location: TBA

18-20 March 2012

Geological Society of America

Northeastern Section Meeting, Hartford.

see: http://www.geosociety.org/Sections/ne/2012mtg/

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