

# GeoConnections



JOIN US FOR THE GSC

## SPRING 2016 FIELD TRIP

### Wallrocks of the Hodges Complex and Tyler Lake Granite, West Torrington, Conn.

**Trip Leader:** Dr. Charles Merguerian

**Date:** Saturday April 16, 2016

**Time:** 8am

**Meet:** Location TBA

The GSC Spring 2016 field trip will include many stops illustrating the stratigraphy and structure of the Wallrocks of the Hodges Complex and Tyler Lake Granite. We will discuss separation of the subunits of the Hartland and Waramaug formations on either side of Cameron's Line, a folded Taconian plate boundary suture zone. Ductile structures and lithologies associated with Cameron's Line and contact relationships with crosscutting plutons will be examined. The trip will be an amalgam of stops from a previous NEIGC trip conducted three decades ago (Merguerian 1985) and will include additional stops based on more recent investigations. A guidebook will be provided.

Dr. Merguerian, Professor Emeritus at Hofstra University, Visiting Research Fellow at Yale University, and Principal of Duke Geological Laboratory, is a leading authority on the geologic structure and tectonics of New York City. His professional experience includes: geologic mapping and structural analysis of complexly deformed metamorphic terrains, petrography, ductile- and brittle-fault analysis, earthquake-hazard assessment, as well as geological mapping of tunnels mapping and subsurface structure of New York City and vicinity. His work on the relationship between the geology and geotechnical methods of excavating tunnels and shafts has improved subsurface construction techniques.

Dr. Merguerian has been featured in television documentaries aired by the BBC, National Geographic, The History Channel and The Discovery Channel.

\$25.00 for members; \$10.00 for student members; \$45.00 for non-members. This will include the guidebook.

**Space is extremely limited for this trip,**

**Be sure to register early!**

**Registration deadline: Sunday April 10**

**Register online using Paypal**

[www.geologicalsocietyofconnecticut.org](http://www.geologicalsocietyofconnecticut.org)

**Questions? Email us: [Geosocietyct@gmail.com](mailto:Geosocietyct@gmail.com)**

### From the... President's Desk

Attendance at the 2015 Annual Meeting, hosted by CCSU, was good, and we take that as a positive sign that we are on the right track with regard to serving your geologic curiosity. In addition to dinner and the business meeting, attendees enjoyed an open house (including a planetarium show!) at the CCSU Department of Geological Sciences in Copernicus Hal, a display of student posters, and a lecture from Dr. Charles Merguerian. The lecture was entitled "Wallrocks of the Hodges Complex and Tyler Lake Granite, West Torrington, CT". Please check out the details of his April 16th follow-up field trip on page XX ! (Peter we need a page # here)

Positive feedback, in the form of good attendance at meetings and field trips, keeps us going. We think that our November, 2016 offering will be of interest to many of you so please stay tuned for the details. (Peter please edit this to include a referral to a write up if there is one in this edition) Although we have a speaker for November, we must constantly look to the future That means identifying speakers and field trip subjects/ locations that interest you. If you, or anyone you know, is doing interesting things in Connecticut, and would like to give a talk or run a field trip, please contact us. Having everyone involved and sharing is the only way we can continue to offer programs/information of relevance to our members. I cannot overemphasize our need to hear from you if you have suggestions for initiatives that would enhance the Society's value to you.

With regard to the Student Research Fund, I am happy to say that we had ten applicants from eligible students this funding cycle. Unfortunately, we currently do not have the financial resources to fund them all. You can help to remedy this by making a contribution to the Student Research Fund. Please keep in mind that your contributions directly support students who are interested in focusing their talents on geologic investigations in Connecticut.

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## COMMITTEE REPORTS

**The Treasury Report**

The Society treasury is in reasonable shape for a non-profit organization in the spring of its 7th year.

With a focus on educational lectures and field trips, the Society is serving its mission well. The Society events bring us together, and inform us in a collegial and entertaining way. Costs are kept low and student members are supported to welcome attendance. Annual meeting costs and registration fees are truly break-even.

Field trip registrations are established to reimburse guidebook printing costs, and unexpected expenses. Typically, fieldtrip costs are low due to donated and sponsored services. Consequently, most of the gains to the treasury through the year come from fieldtrip attendance.

Treasury assets at this time (3/16) are near \$10K (\$9,954.33), \$1760.25 of which is reserved for the Student Research Fund. This enables the Society to support more students with worthy Connecticut research proposals. Naturally, the Society would like to provide even more student research grants! There have been discussions among Board members about transferring additional Society reserves to the Student Research Fund. Other ideas involve strategies to make the Student Fund more self-sufficient.

With prudent stewardship of Society funds and continued engagement of the membership, the Treasury will be capable of serving the mission and needs of the Society into the future.

~ Margaret Thomas, Treasurer, March, 2016

**Student Grant Program Receives Record Number of Applicants.**

Submitted by Meg Enkler

With a goal of supporting new research in Connecticut geology, 3 years ago the Society started a grant program. Grants are available to both undergraduate and graduate students. The research must be taking place in Connecticut and applicants must be members of the Society. In year one we had one applicant who was given a grant. In year two we had three applicants, all of whom were given grants. In 2016, we had 10 applicants from four different universities!

Ralph Lewis, Fritz Moritz and Meg Enkler served on the subcommittee to evaluate the applications. We had a very difficult job this year choosing between so many worthy projects. Acting on the recommendation of the committee, the Board decided to award four grants for a total of \$1,800. This has used up all of funds set aside for these grants so we do encourage members to make a donation to support this important program so that we can continue to support students again in 2017.

**Grants were awarded to the following students:**

**Melissa Luna & Jacqueline Giblin from Central Connecticut State University, Faculty Sponsor Dr. Mike Wizevich.**

**Project Description:** The purpose of this study is to provide a better understanding of the source rocks for the Mesozoic sediments that make up the Hartford Basin located in central Connecticut. Previous techniques have not settled the debate for the source (from the east or the west or both) area of the sediments within the Hartford basin, thus, we are utilizing detrital zircon age dating, which allows us to "finger-print" the source are of these sediments. The uranium-lead (U-Pb) radiometric can be used to acquire age dates of zircon grains within sedimentary rocks. Since all sediment is derived a particular source rock, knowing the age of the source rock can constrain the area from which the sediment came from. Through this techniques, the source areas of the sediment fill will be determined, along with a refinement of the paleogeography and tectonic models for the Hartford Basin. This project has 3 components,

the Triassic New Haven Formation and the Jurassic Portland Formation which will be done as separate projects by the students. The Faculty sponsor, Mike Wizevich will be working on the Pomperaug Basin. This project was awarded \$800, each student will receive \$400.

**Martha Denisky from Eastern Connecticut State University, Faculty Sponsor Dr. Peter Drzewiecki.**

**Project Description:** My project aims to examine sedimentological, geochemical and paleontological data to reconstruct the paleoecology of Jurassic lake environments in Connecticut. The goal is to determine how the ancient lake ecology changed throughout the East Berlin and Portland Formation deposition, in response to changes in climate and environment. To complete this research, we have already begun collaboration with curators at Dinosaur State Park and the Peabody Museum, where the fossil specimens reside. This project was awarded \$500.

**Bryan Wathen from Indiana University, Faculty Sponsor Dr Robert Wintsch.** Project Description: I propose a study of schists with multiple interfering fabrics that produce wave-like patterns. Two interpretations have been made in such rocks, each with significant implications about the tectonic processes responsible for their development. They have been described and interpreted as being caused by a single deformational event during which one cleavage developed orthogonal to the principal shortening direction (S) and the other formed parallel to the direction of maximum shear stress (C), known as S-C fabric. However, the same fabric can be interpreted as an overprinting of cleavages produced when a later cleavage crenulates an earlier one producing a crenulation cleavage. Differentiating between these two is important because it will reveal whether shear zones moved only once, or were reactivated, and might be reactivated again. If the times of reactivation can be identified, this would lead to a considerable refinement and understanding of tectonics processes.

We hope to see posters from these students at our next annual meeting. Congratulations to all and we encourage those who did not receive a grant this year to apply again.

**The President's Desk....continued from page 1**

With regard to the Student Research Fund, I am happy to say that we had ten applicants from eligible students this funding cycle. Unfortunately, we currently do not have the financial resources to fund them all. You can help to remedy this by making a contribution to the Student Research Fund. Please keep in mind that your contributions directly support students who are interested in focusing their talents on geologic investigations **in Connecticut**.

I would also like to solicit your nominations for our **Joe Webb Peoples Award**. In honor of Dr. Joe Webb Peoples, this award recognizes individuals who have contributed to our understanding of the geology of Connecticut through scholarship, education, and service. Nomination details are on the web site (<http://www.geologicalsocietyct.org>).

~ Ralph Lewis, GSC President

*Connecticut Geology Report***An Exposure of Lower Till in Trumbull, Connecticut**

by Harold "Fritz" Moritz

During the winter of 2009-2010 a Home Depot store was constructed at a site on state Route 111 in northern Trumbull (aka Long Hill). This site initially saw some grading and rock removal in the 1990s for a planned retail outlet known as Old Mine Plaza in allusion to the adjacent Old Mine Park. However, no construction was ever done and it sat idle until the Home Depot construction.



**Figure 1.** Underground storm water retention basin under construction in January 2010. The walls exposed mostly amphibolite bedrock, but glacial till was exposed in the corner at far left (Harold Moritz photo).

With its proximity to Old Mine Park, a place famous for its topaz and fluorite-rich hydrothermal veins and amphibolite-hosted scheelite and ferberite pseudomorphs thereof, the defunct plaza and the new Home Depot construction were a magnet for mineral collecting. The bedrock is mostly amphibolite, with some marble, mapped as the Silurian basal member of The Straits Schist, which outcrops locally in the area. There was generally little sediment cover of Pleistocene age on the site.

However, during the Home Depot construction a large, underground storm water storage gallery was constructed by blasting a chamber into the bedrock. This was presumably done because of the limited land available for a surface retention basin, so it was placed under the parking lot by filling the space with nested, hollow concrete structures that could support the overlying parking (see Figure 1). The walls of the gallery exposed mostly amphibolite bedrock, but the southeast corner revealed a layer of overlying glacial till.

I found this small till outcrop (see Figure 2) interesting because it provided a relatively rare, fresh cross-section of what appears to be the lower till. Although lower till is generally thicker than the upper till because it cores drumlins and other areas of thick till (see Melvin and others, 1992 and Stone and others, 2005), the upper till almost completely blankets the lower till from view. If there was any upper till at this site it was stripped away by site grading. Because glacial till in general does not have much economic value there are few excavation pits where it was mined for anything other than "clean fill" on a small temporary scale.



**Figure 2:** Exposure of what appears to be lower till in the wall of the retention basin. Note the fine-grained, deformed matrix and tightly packed cobbles and boulders. Some of the boulders may look competent, but some could be readily crumbled by scraping with the hammer shown for scale (Harold Moritz photo).

Lower till tends to be clay-rich and so compact that it can be difficult to excavate or drill through. At a large construction site in Cromwell, along state Route 372, between I-91 and state Route 3, an excavator was used to cut into a lower till exposure. It carved a wall that was actually overhanging, with prominent bucket teeth marks.

Along I-95 in Branford, I worked at a site underlain by arkosic conglomerate where an excavator apparently refused on this material, as did screw augers. However, subsequent drilling with a tri-cone rotary bit and water circulation passed through tens of feet of this "rock-like material" before refusing on the actual bedrock. What I thought was shallow bedrock was actually dense lower till that had the same red-brown color (common in till overlying the Mesozoic sedimentary rocks) as the underlying conglomerate. Lower till at the ConnDOT facility on state Route 3 in Rocky Hill, next to Dinosaur State Park, is similarly so dense that it could only be drilled with difficulty.

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***Connecticut Geology Report...continued***

Lower till lies directly on bedrock and given its compact nature was almost certainly formed under continental scale ice sheets and may have been overridden by multiple ice advances. Thus it could date back to the beginning of the Pleistocene 2.59 Ma and display evidence of deformation in the finer-grained matrix and decomposition of larger clasts. Such is the case at the Trumbull exposure.

The matrix at Trumbull is pale gray, very compact, unconsolidated silt and clay. But boulders and cobbles make up around half of the exposure. They are very tightly packed into the matrix and may be framework supported as they are almost touching in many areas and nearly fit together like a mortared stone wall. The matrix shows evidence of deformation from compaction, but also shows orange-rusty staining along fractures closer to the surface. The cobbles and boulders consist mostly of light colored to rusty schistose rocks, with only a few white marble and dark amphibolite rocks present despite their proximity. Interestingly, many of the schistose boulders were nearly

completely decomposed, their feldspars altered to clays, and could be crumbled by simply scraping them with the small rock hammer shown. They were obviously very competent when emplaced but enough time has passed to allow in-situ weathering similar to the formation of saprolitic soil from bedrock, but in this case only within specific clasts.

I've encountered similarly decomposed boulders in drill samples from lower till in Bantam, but never in upper till. Could this process have happened during only the latest glaciation of the past 100,000 years, or is it evidence that this till is from a much older Pleistocene glaciation?

Melvin, R. L.; Stone, B. D.; Stone, J. R.; & Trask, N. J. (1992), Hydrogeology of thick till deposits in Connecticut. U. S. Geological Survey open-File Report 92-43.

Stone, J. R.; Schafer, J.; London, E. H.; DiGiacomo-Cohen, M. L.; Lewis, R. S.; & Thompson, W. (2005), Quaternary Geologic Map of Connecticut and Long Island Sound Basin. USGS Scientific Investigations Map 2784.

## GSC 2015 Annual Meeting Central Connecticut State University

By Peter M. LeTourneau

Photos by Drew Hyatt, ECSU

On Friday November 13 (obviously a lucky day for the GSC!) more than 75 GSC members gathered at Central Connecticut State University for the 2015 Annual Meeting. Hosted by the Department of Geological Sciences, the meeting featured tours of the department facilities and the Copernicus Planetarium, poster presentations by students, a keynote lecture by Dr. Charles Merguerian, and the awarding of the 2015 Joe Webb Peoples Award.



The GSC Board at the registration booth



Student research posters were a big hit!



The rising stars of science: student researchers!



Old friends and new enjoying the meeting.



Wow! An impressive gathering!

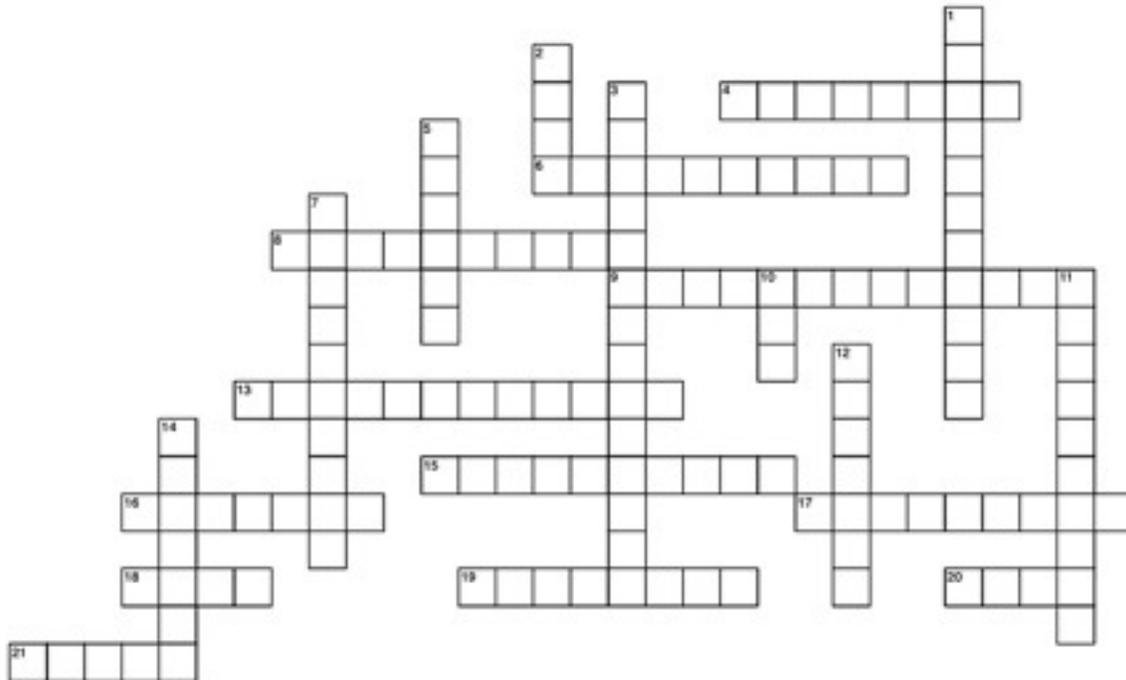
*Are you in the picture?*

Did you remember to renew for 2016?  
Get the members price for all GSC events including the  
Annual Fall Meetings and Spring Field Trips!  
Join or renew today! It only takes a minute!

Visit the GSC website or mail your membership form  
(available online) and payment to our postal address.  
P.O. Box 94, Hadlyme, CT 06439



**SPRING 2015 GEO-PUZZLE “Life’s a Beach”!**



**ACROSS**

- 4 Where waves break
- 6 One of the terminal moraines
- 8 *Ammophila breviligulata*
- 9 *Limulus polyphemus*
- 13 An endangered beach-nesting bird
- 15 The other terminal moraine
- 16 Made by the glacial conveyor belt
- 17 A coastal habitat dominated by *Spartina* sp.
- 18 Not money in a kitty, a glacial deposit
- 19 Odd-ball boulders dropped by the glaciers
- 20 A windblown deposit behind the beach
- 21 A controversial coastal structure used to control erosion

**DOWN**

- 1 Why there are tides
- 2 You might fish off one of these coastal structures
- 3 The motion of sand along a beach
- 5 *Mercenaria mercenaria*
- 7 The glacial headland at Hammonasset
- 10 The outgoing tide
- 11 This mollusk of the rocky intertidal isn't sad, it's colorful!
- 12 Technically, Long Island Sound is one of these types of coastal waters
- 14 The process of wearing away

**Fall 2014 Solution**

Across	Down
3 Ogallala	1 Head
6 Aquifer	2 Marsh
9 Outwash	4 Aquaclude
10 Discharge	5 Estuary
11 Porosity	7 Weir
12 DNPL	8 Piezometer
13 Artesian	12 Darcy
14 Permeability	

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 The Bulletin of the Geological Society of Connecticut**

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