

# GeoConnections



JOIN US FOR THE GSC

## SPRING 2015 FIELD TRIP

### *The Coastal Geology of Eastern Connecticut: Bluff Point to Meigs Point*

**Trip Leader:** Ralph Lewis

**Date:** Saturday April 25, 2015

**Time:** 8am UCONN Avery Point

**Locations:** *From Bluff Point, Groton to  
Meigs Point, Madison, Conn.*

The object of the trip will be to explore the bedrock, glacial and postglacial history of the Connecticut coast as expressed in outcrops, landforms and beaches easily and safely visited at Bluff Point Coastal Reserve, Waterford Town Beach, Harkness Memorial State, Rocky Neck State Park and Hammonasset Beach State Park.

These sites also provide an opportunity to examine the modern processes that are currently working to modify the coast and a few missteps humans have made in trying to return things to "normal".

The preliminary plan is to have a brief 8:00AM introduction at UConn-Avery Point where, on a clear day, the terminal moraine and most of the offshore recessional moraines of eastern Connecticut can be seen. That will be followed by an examination of the origins of the various beach compositions found at Bluff Point.

After lunch, Waterford Beach and Harkness Memorial will provide an opportunity to examine typical eastern Connecticut sandy beaches, developed on glacial deltas, and pinned between rocky promontories. There are also interesting "management" issues to discuss. Rocky Neck offers bedrock outcrops, glacial deposits, and coastal features/processes that can be used to explain the genesis of most of the landforms that are common in eastern Connecticut. Crawling around the coastal moraine, beach and marsh at Hammonasset will cap things off.

Complete registration information is available on the web site.

The fee structure will be: \$25.00 for members; \$10.00 for student members; \$45.00 for non-members. This will include the guidebook. A complication that should be noted is the parking fee at three of the parks. If we cannot get the fees waived, the total for each vehicle would be \$33.00. Car pooling and van use are there for encouraged. For those over 65 admission is free with a Charter Oak Pass (available free of charge from DEEP).

**Be sure to register early!**

**Registration deadline: Sunday April 22**

**Register online using Paypal it is fast and convenient  
You do not have to be a PayPal member!**

**See the GSC website for mail-in registration form.**

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

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

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

You may recall that two of the initiatives that emerged from the board retreat last summer involved supporting geologic research in Connecticut through our Student Research Fund and staying relevant with our talks, field trips and educational offerings. With regard to the Student Research Fund, I am happy to say that we funded three proposals from students this funding cycle (please see the related article that follows). It is important to remember that your contributions to the Student Research Fund directly support students who are interested in focusing their efforts on Connecticut geology.

With regard to keeping our offerings relevant, the impressive November turnout at UConn for Dr. Gary Robbins's talk entitled "Connecticut's Groundwater: The Gold Beneath Our Feet" was a clear indication that the subject was of interest to you. That is the type of positive feedback that keeps us going. We now need to turn our attention to the future. That means identifying speakers and field trip subjects/locations that interest you. We have had a successful meeting with representatives of the nine academic departments that make up our Academic Advisory Board. They have indicated a real interest in mutually beneficial efforts to promote "things geological" in Connecticut. As that relationship matures, I am certain good things will happen. We must, however, not overlook you as a resource. 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.

I look forward to seeing everyone at the Spring Field Trip, Saturday April 25!

~ Ralph Lewis, President

### In this issue of GeoConnections

2015 Spring Field Trip	1
From the President's Desk	1
Committee Reports	2
GSC Student Research Fund	3
Mineral Report: Fluorite	4
Connecticut Rocks!	6
Geo-Puzzle	10

**COMMITTEE REPORTS**

**The Treasury Report**

We had a very successful annual meeting at the University of Connecticut this year, with a registration of 103 people. With all the bills paid, \$165.79 was added to the treasury. During the meeting, sales of guidebooks and glassware raised \$758.45 for the Student Research Fund. Thanks to all who supported the cause!

Guidebooks and glassware sales will continue at other Society events. There will be no mail orders. Notice will be sent to members when pdf documents of guidebooks are available online.

Current assets of the Society total \$8892.60, reported March 4th for the Board of Directors meeting. Earmarked Student Research Funds are \$2528.25 (included in total assets).

Sources of Revenue included Memberships, Event Registrations, and Contributions. Expenses included Annual Meetings, Field Trips, Publications, and Website.

Here is a brief summary of our last fiscal year, as reported at the Annual Meeting.

**Fiscal Year (7/1/2013 - 6/30/2014)**

Beginning Balance of Accounts	\$6,665
Total Revenue	5,309
Expenses	4,538
Gain for the Treasury	771
<b>End of FY Balance</b>	<b>\$7,436</b>

Revenue received by the Society has been designated to meet Society educational objectives as stated in the bylaws. The prudent use of resources this past FY, resulted in an 11.57% growth in the treasury.

Improvements in Membership and the Student Research Fund contributions this Fiscal Year will enhance the Societies capabilities to expand educational offerings and publications, as well as increase student research support without eroding the Society's fiscal base.

Treasurer's recommendations for this FY include maintaining the Society 'break-even' philosophy for Events, and keep costs down to encourage participation, along with a targeted membership drive, and separate fund raising initiatives for the Student Research Fund.

The Society annual IRS Form 990 has been filed, and posted to the website.

GSC tax filings are also available on other websites that rate non-profit organizations.

**~ Margaret Thomas, Treasurer**

**This Just In...**

**From the Secretary's Portfolio**

The 2014 Annual Meeting in November provided an opportunity to gather with our fellow Society members (91 to be exact), to hear two excellent speeches by DEEP's Commissioner Robert Klee and UConn's Dr. Gary Robbins, and to make some important decisions as group. We took a vote on guidebooks for which there was unanimous support for both keeping the guidebooks in print, as well as having them available online, downloadable for a fee. We also voted on adjusting the dues year from the calendar year to now having the dues year begin with the annual meeting and end prior to the following annual meeting.

Subsequently, the Board has updated the Society's by-laws to reflect this decision. Other announcements to the membership involved the newly-formatted web site and canvassing ideas and volunteers for the Spring field trip.

Since the Annual Meeting the Board has met twice. The discussions have included planning for the annual field trip on April 25, selection of scholarship recipients, taxes, feedback from the Academic Advisory Panel, and revitalizing the Membership Committee. The Board meeting minutes and by-laws are posted on-line at [geologicalsocietyct.org](http://geologicalsocietyct.org). If you have any suggestions or would like to volunteer for one of our planning committees, please email the Board at [geosocietyct@gmail.com](mailto:geosocietyct@gmail.com).

**~ Camille Fontanella  
GSC Secretary**

**The GSC  
Academic Advisory Committee**

The GSC Board voted to establish an Academic Advisory Committee to better connect with academic institutions throughout the State offering geological science and related academic disciplines. The Committee members consist of one faculty member, appointed to the GSC Committee, who has been nominated from each college or university geology/earth science program.

**~ Dan Vellone**

The following faculty are currently appointed to the GSC-AAC:

Jay Ague, Chair  
Department of Geology and Geophysics  
Yale University

Lisa Park Boush, Director  
Center for Integrative Geosciences  
University of Connecticut

Peter Drzewiecki, Chair  
Department of Environmental Earth Science  
Eastern Connecticut State University

Mark Evans, Chair  
Department of Physics/Earth Science  
Central Connecticut State University

Thomas H. Fleming, Chair  
Department of Earth Science  
Southern Connecticut State University

Christoph Geiss, Director  
Department of Physics and Environmental Science  
Trinity College

Phillip Resor, Associate Professor  
Department of Earth and Environmental Sciences  
Wesleyan University

Douglas M. Thompson, Chair  
Department of Geology, Physics, Geophysics, Astronomy  
Connecticut College

Christine Witkowski, Environmental Science Program Coordinator  
Middlesex Community College

## GSC STUDENT RESEARCH FUND REPORT

**Three Student Grants Awarded!**

The Board is pleased to report that the Geological Society of Connecticut will be sponsoring three student projects this year. The program began last year, and James Farrell was the first student to benefit from the new GSC Student Grant Program. All students are members of the Society and all are doing work here in our state. Once their work is complete they will submit articles to our newsletter detailing the results of their research. Below is a summary of each of the projects. Many thanks to everyone who has donated to the grant fund so far, we hope that those of you who have not will be encouraged to do so to help support similar projects in the future. Monies earned at the annual meeting from glassware sales are also being allocated for future grants. We will accept another round of applications in January of 2016.

~ Meg Enkler

**FUNDED STUDENT RESEARCH PROJECTS**

**Alexander A. Conti, Ohio University**

***Lacustrine cycles of the Jurassic East Berlin Formation, Hartford Basin, Newark Supergroup: Under-filled or balance-filled lakes?***

The Mesozoic Hartford Basin is a failed rift in southern New England containing seven stratigraphic units belonging to the Newark Supergroup. One poorly constrained unit, the lacustrine, playa, and alluvial East Berlin Formation, has been fully exposed for the first time through a series of seven cores in Hartford, CT. My research analyzes these cores to map the evolution and stratigraphy of lake cycles recorded in black shales across the East Berlin Formation. The data will add new and significant context to the lake model paradigm, which is vital to the advancement of both hydrocarbon exploration and understanding biogeochemical cycling in ancient lake environments.

**Christopher T. Jorgensen, Ohio University**

***Lake Cycles and Vertisols of the lower Portland Formation of the Hartford Basin, Connecticut***

This study will outline the exact stratigraphy of the lower Portland Arkose in the center of the Hartford Basin, using geochemistry and clay mineralogy of paleosols and black shales both for correlation and to assess climate and tectonics during formation.

**Kyle Gearwar, University of Connecticut**

***Importance of Geology in the Preservation of Historic Monuments***

This project aims to identify the source(s) of basement flooding in the historic Governor Jonathan Trumbull House in Lebanon, CT by studying the surficial geology and hydrogeology of the estate.

**The 2014 Scholarship Campaign:  
Your Donation Dollars At Work**

***A Successful Effort, but Wait, We're Not Done!***

The Fall 2014 fundraising campaign for the GSC Student Research Grant was a great success, helping GSC to be able to offer research grants to three recipients in 2015.

Our limited edition engraved GSC Beer and Wine Glasses sold at the 2014 Annual Meeting at the University of Connecticut were a big success; however, limited quantities remain. The remaining quantities of GSC-logo glassware will continue to be sold until all quantities are gone. The glassware will be sold at a price of \$20.00 each for either style as long as supplies last. Show your dedication to supporting student scholarship in Connecticut and your support of GSC, and get your glass today.

The student research grant is intended to support full-time Junior or Senior undergraduates or Master's degree candidates who are actively researching an aspect of Connecticut geology under the direction of a faculty advisor. The award is intended to support expenses related to conducting field work and/or laboratory analyses. For scholarship guidelines and application deadlines, please visit: <http://geologicalsocietyct.weebly.com/student-grants.html>

Purchase of the GSC-logo Beer and Wine Glasses may be made in cash or by credit card through PayPal credit card reader at the Spring 2015 Field Trip. Additional donations to the research grant fund are also accepted anytime through the GSC website (and greatly appreciated!).

~ Dan Vellone



**Connecticut Mineral Report****Fluorite in Connecticut**

by Harold "Fritz" Moritz

All photos by the author

Connecticut is blessed with a great variety of mineral-forming environments, and one of the most aesthetic minerals found here is fluorite (CaF<sub>2</sub>). Its occurrence is widespread, so far it was found at about 35 places ([www.mindat.org](http://www.mindat.org)) that can be grouped into 3 types with different approximate crystallization temperature and depth conditions and ages:

1. Epithermal deposition in fault zones (50-200°C, 1-3 km) Late Triassic-Early Jurassic.
2. In veins with quartz, muscovite, topaz (>200-400°C?, 3-5 km?) Late Pennsylvanian??
3. In pegmatites (<~350-450°C, 4-9 km) Devonian (west) Permian (east).



Figure 1: Cubic fluorite in quartz, Somers. FOV 3 cm



Figure 2: Octahedral fluorite on quartz, Reed Gap Quarry. FOV 1.5 cm.

Epithermal mineralization is geographically most prominent in the Mesozoic Hartford Basin and is intimately associated with intense Mesozoic faulting, which in the New Britain area are spaced every few meters. Despite the myriad of faults, fluorite is quite rare in the basin. Examples include only the Middletown Lead Mine and Somers barite location (Figure 1) (both on the Eastern Border Fault of the Hartford Basin); the Reed's Gap Quarry in Durham/Wallingford (Figure 2) and the Jinny Hill barite mine in Cheshire (Figure 3) (in fault breccia cutting the Jurassic Holyoke Basalt and Triassic New Haven Arkose, respectively).



Figure 3: Cubic fluorite with quartz and barite, Jinny Hill Mine, Cheshire. FOV 3.5 cm.

In the Western Highlands, in fault zones cutting metamorphic rocks, fluorite is only common in northern Trumbull (Figures 4 & 5), at Thomaston Dam in pure veins 1-2 meters thick (Figure 6), and at the Naugatuck Haynes Quarry (Figure 7). The colorless, green to purple fluorite's habit is typically cubic or octahedral and the crystals are associated with mainly quartz, calcite, barite, pyrite, galena, sphalerite and zeolites, many well-crystallized in open spaces. Most of it shows the typical bright purplish-blue fluorescence under long-wave UV light. Their low-temperature deposition was likely driven by high geothermal gradient from rifting and hydraulic head circulation from mountain ranges. Their size and distribution, along with other mineralized faults, argues for an extension of the Hartford Basin across western Connecticut. Three very minor occurrences in the Eastern Highlands are all situated in Avalonian (Salem, Mansfield) and Gander Terrane (Stony Creek) rocks, though that may be related to exposure bias.

***Connecticut Fluorite...continued***

**Figure 4: Cubic fluorite, Home Depot site, Trumbull. FOV 1.6 cm.**



**Figure 5: Octahedral fluorite, Home Depot site, Trumbull. FOV 1.2 cm.**

In northern Trumbull (aka Long Hill), in and around the area of Old Mine Park, including the new Home Depot store and Corporate Drive, are additional fluorite-rich hydrothermal veins that differ from those described above. Here the colorless to reddish fluorite is massive and associated with massive quartz and subhedral topaz in solid slab veins bordered by muscovite±margarite±albite±marialite. Besides the blue-purple LW UV fluorescence, this fluorite displays an

intense blue-green fluorescence under short-wave UV light (or when heated) and is thus the chlorophane variety (Figure 8), which is not seen in the other epithermal veins but is also in pegmatites (see below). The presence of chlorophane and topaz suggests a higher temperature and depth of emplacement, perhaps associated with plutons, such as the nearby 291±4 mya Pinewood Adamellite, which contains accessory fluorite. These unique veins and nearby plutons could really use some serious study.



**Figure 6: Cubic fluorite with quartz, Thomaston Dam. 5.5 x 6.5 cm.**



**Figure 7: Cubic fluorite with quartz, Haynes Quarry, Naugatuck. FOV 4 cm.**

**Connecticut Fluorite...continued**



**Figure 8. Fragments of chlorophane, fluorescing under SW UV. FOV 20 cm.**

The third type of Connecticut fluorite occurrence is in granitic pegmatites. There are at least 12 pegmatites where fluorite was found, all except the Fillow pegmatite (Devonian) near Branchville are in the Middletown pegmatite district of eastern Connecticut (Permian). These are LCT type pegmatites, many with complex chemistry and multiple zones with differing minerals and textures. In most of these pegmatites, the fluorite is just the chlorophane variety (usually deep red and massive to octahedral), reflecting deeper emplacement (say 7-9 km). But at the Strickland pegmatite, in the vuggy inner zone adjacent to the quartz core zone, a last-gasp of low temperature crystallization also formed a paragenesis that includes colorless, pale green to dark purple, cubic to octahedral fluorite (Figure 9) associated with calcite, pyrite, quartz, fluorapatite, and

zeolites. This assemblage reflects the relatively shallow emplacement depth of 4-5 km regarded for this type of pegmatite and the point where the 150-250°C temperature of remaining, water-rich fluid phase resembles an epithermal system.



**Figure 9: Cubic fluorite, Strickland Quarry, Portland. 2.4 x 2 x 2 cm.**

Because of Connecticut's long and varied geologic history, we have a wonderful diversity of rocks and minerals compared with many other states. This brief look at just fluorite shows that many aspects of that history are understood, while many more remain fuzzy. Who out there will clarify them?

**Are you in the GSC picture?  
Did you remember to renew for 2015?**

**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...you do not have to be a Paypal member to pay by credit card!*

*Or mail your membership form (available online) and payment to our postal address.*

**P.O. Box 94, Hadlyme, CT 06439**

*~ Editor.*



## Connecticut Rocks!

### Portland Brownstone

by Peter M. LeTourneau, Ph.D.

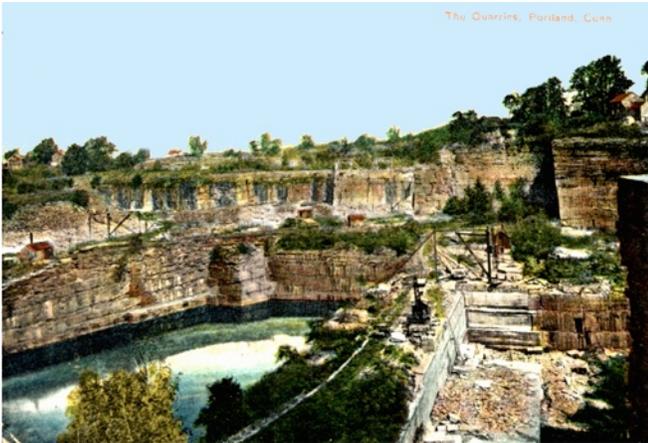


Figure 1. The Portland brownstone quarries, circa 1910. Today the quarry is filled with water up to the base of the upper level.

No building material is more closely associated with American cities than brownstone. The word conjures up images of row houses, elegant town-homes, ornate decorative carvings and monuments. Brownstone was a highly fashionable and desired building material during the late 1800's and early 1900's. The golden age of urban development coincided with the peak desire for the warm brown stone, as a result brownstone buildings are common in cities along the eastern seaboard.



Figure 2. View of south and east walls of the flooded brownstone quarry.

Brownstone is the trade name for the Portland Formation arkosic sandstone ("Portland arkose"), which is made of quartz and feldspar sand with calcite and hematite cement.

The story of Portland brownstone began over 185 million years ago when North America, South America,

Europe, and Africa were joined together into a "super-continent" called Pangea ("all-land"). During the Early Jurassic the Connecticut Valley rift was marked by alternating wet and dry climatic intervals, with warm and dry climates favoring the formation of sand dunes and seasonal rivers. The Portland brownstone was deposited near the eastern margin of the rift where alluvial fans, sand dunes and seasonal rivers occurred. The vagaries of erosion and sedimentation produced beds of medium-coarse relatively well-sorted sandstone that had good potential for dimension stone.



Figure 3. Large prosauropod (*Otozooom*) tracks and a smaller theropod (*Grallator*) track from the Portland brownstone quarry. Wesleyan University collection.

Fossils are relatively common in the Portland quarry, but they occur as traces, molds, and casts rather than mineralized remains. Dinosaur tracks including the three-toed prints of the carnivorous theropods *Eubrontes* and *Grallator*, and the large prints of the prosauropod *Otozooom*. Excellent examples of tracks from the Portland quarry are on display at Wesleyan University and Dinosaur State Park. Small, terrestrial crocodiles created quadrupedal tracks known as *Batrachopus*. Burrowing invertebrates also left their marks in the wet sediment. Backfilled burrows called *Scoyenia* are attributed to crayfish or other decapod crustaceans. Plant fossils include layers of macerated debris and branch and trunk casts.

The Portland Brownstone quarry is located on the banks of the Connecticut River in Portland, Connecticut where early settlers noticed that the fine-grained sandstone was good for making mill stones (grinding stones) or for structural use in buildings (so-called "jamb-stones"). In Portland, the chance occurrence of fine eolian ("wind-blown") sandstone deposits was responsible for the growth of a regional industry and a national trend in architectural

fashion. Other red bed quarries are found in the rift valleys of eastern Virginia, north-eastern Pennsylvania, New Jersey, and Connecticut, but none rival the fine quality and color than the stone found in Portland, Connecticut.



Figure 4. Tracks of *Batrachopus*, a small crocodylomorph. Portland quarry. Prints approx. 25mm long.

Stone was produced from the quarry beginning in the 1700s and by the late 1800s the brownstone industry was employing hundreds of workers from Wales and Germany, thriving in three quarries. Stone was cut in the quarry and then placed in storage areas for "seasoning", or allowing the natural groundwater in the stone to seep out, slowly firming the stone in the process. Unseasoned stone was subject to peeling or cracking as the water in the rock froze in the winter months.

The cut and seasoned stone was hauled by horse cart and later by steam-powered cable winches to barges docked on the riverbank. There, sail-powered barges, called "brownstone schooners" hauled the stone to cities all over the east coast, with most of the stone destined for New York City. Portland Brownstone was used in cities throughout the U.S., including San Francisco and Denver.

The buildings on Wesleyan's "college row" are constructed mainly of Portland brownstone. The college once held a financial interest in the quarries as well.



Figure 5. The old geology building at Wesleyan, fittingly made of brownstone, once housed a natural history museum on the upper floor.



Figure 6. The former Portland Library, a fine example of 19th century stonework.



Figure 6. Brownstone row houses, Manhattan.

The popularity of Portland Brownstone would, however, lead to its demise because Portland, Connecticut was the only place which was able to produce the high quality, fine, chocolate-color, stone desired by builders and architects. During the years of its peak use as a building stone, demand forced the main quarry in Portland to ship rock of less than the highest quality, including "unseasoned" stone.

As the price of Portland Brownstone continued to increase, it was used as a "facing" stone, or thin veneer, an orientation that allowed water to seep into the bedding planes causing the stone to rapidly peel or break apart. Portland brownstone quickly gained a new, but undeserved, reputation as an unstable building material. Buildings made of high quality Portland Brownstone blocks that were properly seasoned and placed are sound and beautiful even after more than 100 years. A notable example of a building constructed entirely of Portland Brownstone is the former Villard house, now the front of the Helmsley Palace hotel on Madison Avenue in Manhattan.

The Portland Brownstone quarries closed when a catastrophic flood of the Connecticut River in 1938 inundated the quarries and equipment, but the end was already in sight at that time because the popularity of the stone was in decline.

From 1994 to 2014 a small brownstone quarry was opened on the edge of the historic main quarry to produce stone for architectural restoration and new building projects. The old quarries were designated a National Historic Landmark in 2000 and are now used as a popular recreational area .

**References:**

LeTourneau, P.M., 2010, Traprock, Tracks, and Brownstone: The Geology of World-class Sites in the Connecticut Valley. Geological Society of Connecticut Guidebook No. 1. ISBN 978-0-942081-17-6

LeTourneau, P.M. and Huber, P., 2006, Early Jurassic eolian dune field, Pomperaug basin, Connecticut and related synrift deposits: stratigraphic framework and paleoclimatic context. *Sedimentary Geology*: v.187, pp. 63-81.

Guinness, Alison C., 2003, Heart of Stone: the Brownstone Industry of Portland, Connecticut. in *The Great Rift Valleys of Pangea in Eastern North America*, Volume II, P.M. LeTourneau and P.E. Olsen, eds. pp. 224-246. Columbia University Press 2003.

All images: PML.

## Bits and Pieces...

*...items of interest to our members!*

### Private Connecticut Mineral Collections Available for Study

Most readers will know that there are institutional mineral collections, such as at Yale, Harvard, Wesleyan, Amherst, the Smithsonian, etc., that have specimens of local origin available for research. There are, however, many private collections that can be tapped as well. Finding the owners of private collections was once difficult as their existence was not advertised or common knowledge. Today, there are members of the GSC who have such collections and who know of many others that can be accessed. Much of the holdings include specimens from places long lost, mined out, or no longer accessible. For example, recently I provided samples of Connecticut galena for a research project at CCSU, including the only known specimen from the Roncari Quarry in East Granby.

I also sent a sample of beraunite from East Hampton to a researcher in the Czech Republic who found my sample by searching [www.mindat.org](http://www.mindat.org), a web database of worldwide mineral occurrences. Through this site you can contact the owners of specimens posted there. If you need local mineral samples for research, then certainly check these sources, but also feel free to contact me. If I don't have what you need in my 2,800-item Connecticut collection, then I am happy to contact other private collectors who might. Part of the reason we retain these collections is to help you!

~ Harold "Fritz" Moritz  
[fritzandsheila@pobox.com](mailto:fritzandsheila@pobox.com)

## The 107th Annual New England Intercollegiate Geological Conference October 9 - 11, 2015 Wesleyan University

The New England Intercollegiate Geological Conference returns to Wesleyan University for Fall 2015. Featuring student-oriented field trips focused on southern New England, the 2015 NEIGC promises to be a "must do" fall event for all academic and professional geoscientists in the region. Don't miss this great October weekend of field trips and foliage!

The program kicks off Friday with field trips, followed by the famous Friday evening NEIGC "meet and greet", a perfect time to catch up with your colleagues and friends. Saturday and Sunday follow with a full slate of field trips to noteworthy localities throughout the region. Be sure not to miss the festive Saturday evening banquet for great food and fellowship!

Registration includes the information-packed 2015 NEIGC field guide.

NEIGC has been held in New England every Fall since 1901!

For information, registration, and updates visit:

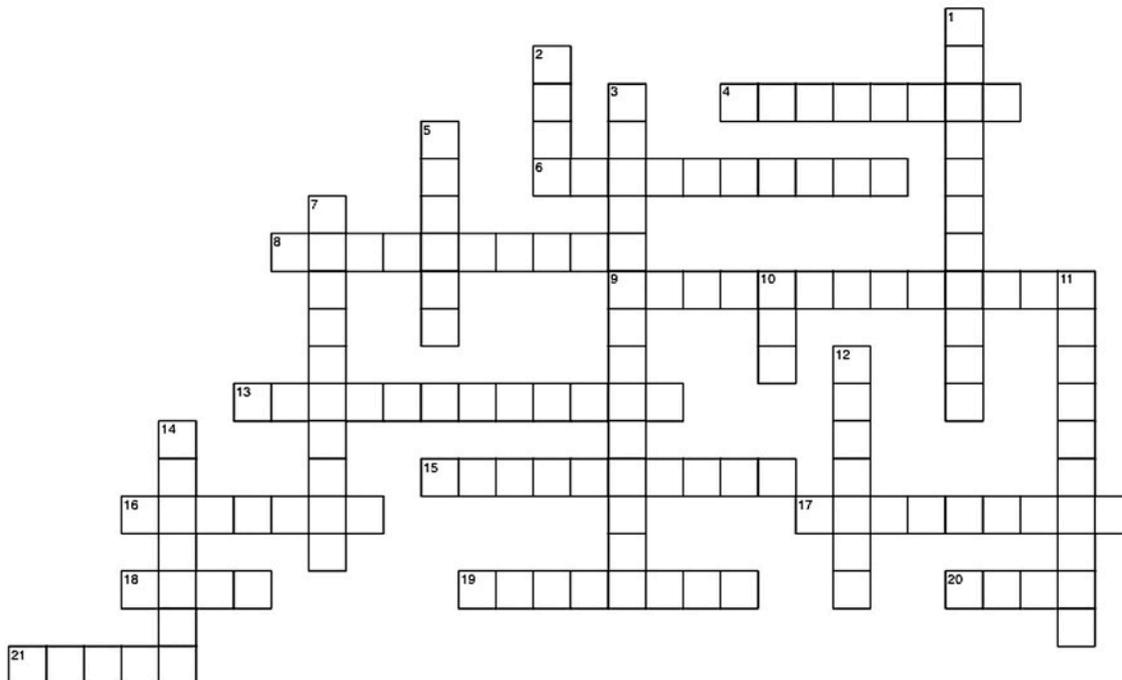
<http://w3.salemstate.edu/~lhanson/NEIGC/Conference.html>

For information regard leading trips contact:

Martha Gillmore [mgillmore@wesleyan.edu](mailto:mgillmore@wesleyan.edu) or Phil Resor [presor@wesleyan.edu](mailto:presor@wesleyan.edu)

~ Ed.

**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	

**Board of Directors:**

- President** Ralph Lewis
- Vice President** Peter M. LeTourneau
- Secretaries** Camille Fontanella, Drew Hyatt
- Treasurer** Margaret Thomas
- Members-at-Large**
- Margaret Enkler Mark Lewis
- Harold “Fritz” Moritz Janet Stone
- Dan Vellone Mike Wizevich

**GeoConnections:**

**The Bulletin of the Geological Society of Connecticut**

**Editor:**

Peter M. LeTourneau

**Contributors, V.4, n.1**

- Meg Enkler
- Camille Fontanella
- Peter M. LeTourneau
- Harold “Fritz” Moritz
- Ralph Lewis
- Margaret Thomas
- Dan Vellone

**Layout/Production**

Peter M. LeTourneau

GeoConnections is published at Hadlyme, Conn. All material copyrighted The Geological Society of Connecticut except where noted. GeoConnections is the copyrighted title of the newsletter of the Geological Society of Connecticut, all rights reserved.

Mail: P.O. Box 94, Hadlyme, CT 06439

Email: [geosocietyct@gmail.com](mailto:geosocietyct@gmail.com)