



Granite State Geologist

The Newsletter of the Geological Society of New Hampshire,
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MESSAGE FROM THE PRESIDENT

Julie Spencer, AECOM, GSNH 2012-2014 President

Ah Summer, as I write this it seems to have arrived earlier than expected, but it serves to remind us that the long hot days of the season are right around the corner.

Third time's the charm? Unfortunately, for us it didn't quite work out that way when Karen Johannesson had to cancel her April talk. It was a mad scramble at the last minute to find a replacement speaker and kudos to the board members who rallied with names and ideas. A big thank you to Sarah Flanagan of the USGS who stepped in at the last minute with a talk on the Water Quality of Crystalline Rock Aquifers in New England. The board is considering whether to re-schedule Dr. Johannesson's talk.

There were two raffle prizes awarded at the April meeting – green perthite won by Scott Wozniakowski and a large quartz crystal won by Tania Brice. The GSNH appreciates both the donation of minerals and the purchase of the raffle tickets, which help us to raise money for our educational outreach programs.

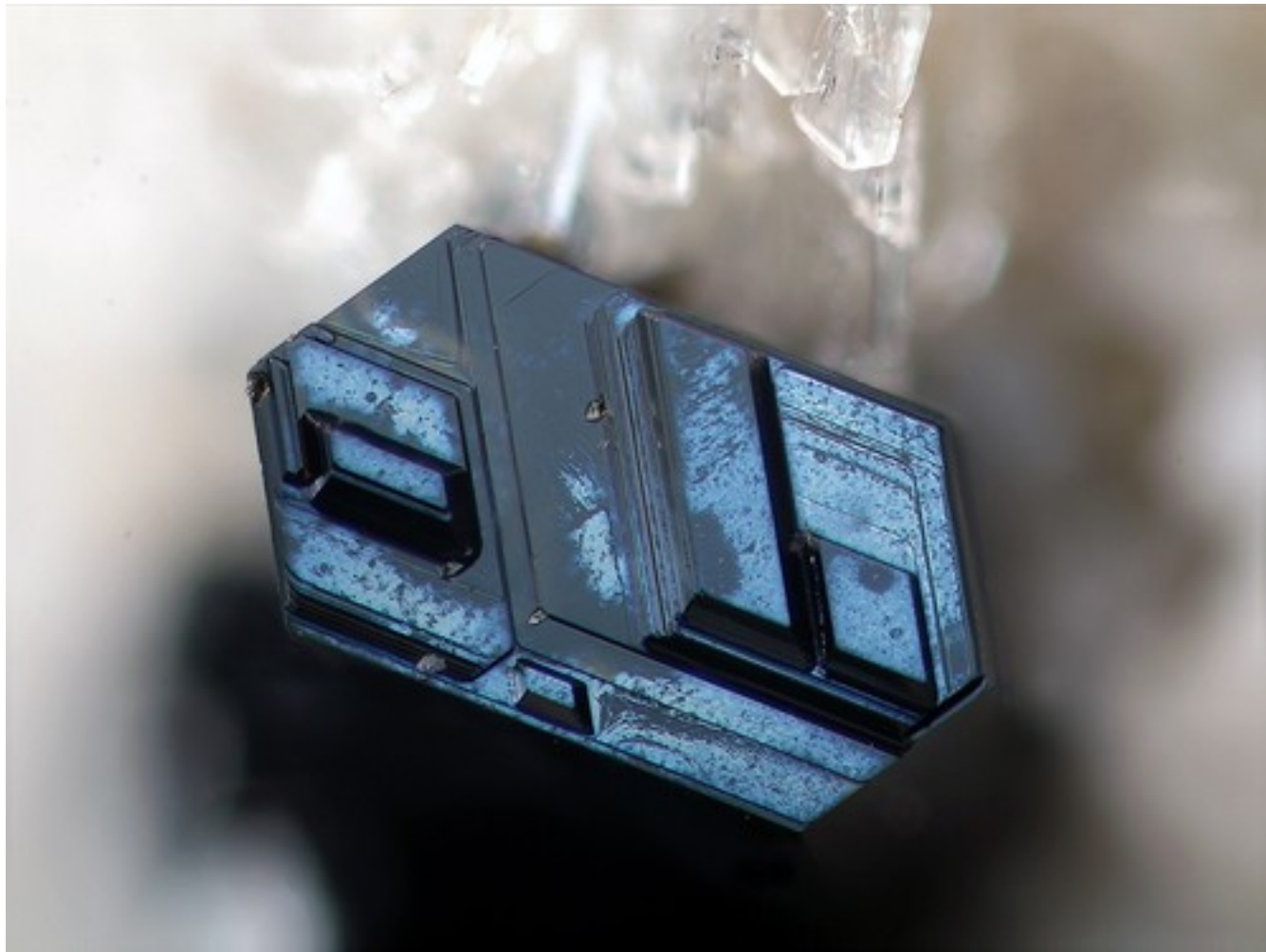
We were also joined by two people from the McAuliffe-Shepard Discovery Center in April. I hope that some of our members will be able to assist the Discovery Center with their outreach to expand their emphasis on earth science. It's great exposure for our organization and will really help the Discovery Center visitors in their understanding of earth science.

The GSNH Summer Field Trip is almost here! Are you on our attendee list? If not, please note that reservations are required. On June 22 (rain date June 23), we will be exploring both bedrock and surficial geology of the Lakes Region of Central New Hampshire. Details are included in the March 2013 issue of the newsletter. Look for photos in our next newsletter.

We are still hoping to co-host a bonus talk this summer with the Vermont Geological Society. It should be a great presentation by Doug Howard, USGS, on his work on the Mars Rover program. The date and location will be announced later in an email to the membership, but we will be looking for a venue intermediate to our two societies. Stay tuned for more details!

Normally this issue of the newsletter would have an article announcing the call for nominees for the October election. Just a reminder that we are now holding elections every other year in even numbered years, so there will not be an October election. We will still have our Annual meeting during Earth Science Week so if we don't see you at the field trip we'll see you in October!

MINERAL HUNTING SEASON – THINK YOU KNOW IT??? GUESS AGAIN!!!



It's biotite from Germany <http://themineralogist.tumblr.com/post/51341439663/biotite-from-germany>

MINERALFEST – 2013 MINERAL SHOW CALENDAR

Find nationwide mineral shows announcements at <http://www.mineralfest.com/calendar.html> like the ones coming **July 27-28** in South Burlington, VT; or **August 24-25** in Concord, NH.

THE NEXT GSNH DINNER MEETING IS

SAVE THE DATE - OCTOBER 17, 2013

AT MAKRIS LOBSTER HOUSE

SOCIAL HOUR START AT 5:30, DINNER AT 6:30

Email reservations will go to **Erin Kirby** at EKirby@Geosyntec.com or

Erin Kirby, GSNH Dinner Meeting, PO Box 3483, Concord, NH 03302-3483.

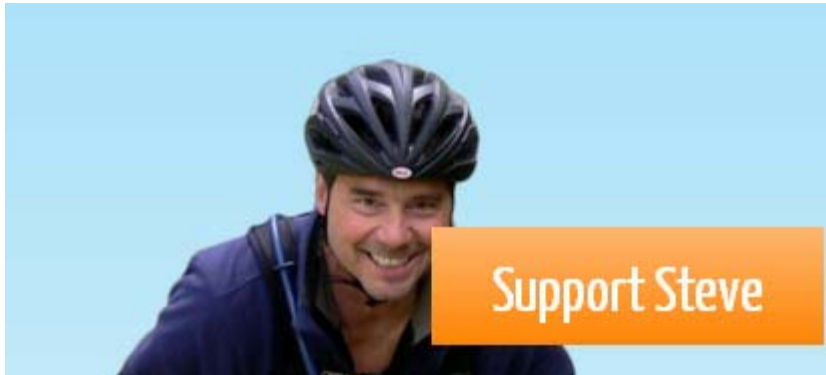
GSNH Policy Reminder:

Please note that a reservation constitutes an agreement with the Society for which you are responsible to pay whether you attend or not, unless you cancel your reservation before 5 p.m. on the Monday before the dinner.

SAD NEWS X 2

We wish to express our condolences to Julie Spencer whose mother passed away in April.

And our best wishes for a speedy recovery to our friend and GSNH member Steve Shope. Steve was injured April 26 in a mountain bike accident, incurring a severe injury to his cervical vertebrae and spinal cord. The Trail to Recovery Fund was created to assist Steve with the astronomical costs associated with spinal cord injuries. Steve is an active member of the outdoor recreation community, an avid surf kayaker and advocate of our trail systems. He is also a volunteer Fire Fighter, First Responder, and member of the local conservation commission. Steve served as the Society's



Membership Chair and the Society sent a message of support to him at his CaringBridge site-- Visit www.caringbridge.org/visit/steveshope. More information and donations may be made through <http://www.trailtorecovery.com/> or mailed to Steve Shop Trail to Recovery Fund | People's United Bank | P.O. Box 294 | Stratham, Stratham, NH 03885 <http://www.seacoastonline.com/articles/20130430-NEWS-304300353>

BOOK DESCRIPTION: 101 AMERICAN GEO-SITES YOU'VE GOTTA SEE

Publication Date: April 15, 2012 | Series: Geology Underfoot

Rocks racing across a lakebed in Death Valley. Perfectly preserved 36-million-year-old tsetse flies in Colorado. Dinosaur trackways cemented into ancient floodplains in Connecticut. A gaping rift in the Idaho desert. What do these enigmatic geologic phenomena have in common? Besides initiating a profusion of head-scratching over the years, these sites of geologic wonder appear side by side, for the first time, in a single publication.

Examining in detail at least one amazing site for all fifty states, Albert Dickas clearly explains the geologic forces behind each one's origin in 101 Geologic Sites You've Gotta See. Dickas discusses not only iconic landforms such as Devil's Tower in Wyoming but also locales that are often overlooked yet have fascinating stories. Consider the Reelfoot scarp in Tennessee: to the casual observer it is nothing more than a slight rise in a farm field. Yet this subtle slope represents a rift formed during an 1812 earthquake that forced the mighty Mississippi to flow upstream. Or Louisiana's unassuming, low-lying Avery Island, which actually caps an 8.5-mile-high column of salt. Amply illustrated with full-color photographs and illustrations and written in clear yet playful prose, 101 Geologic Sites You've Gotta See will entertain and inform amateur and seasoned geology buffs whether from an armchair or in the field. http://www.amazon.com/American-Geo-Sites-Youve-Geology-Underfoot/dp/087842587X/ref=pd_sim_sbs_b_2

SUMMER FIELD TRIP - WHAT YOU NEED TO KNOW

The GSNH Summer Field Trip is almost here! Hopefully you are on our attendee list. If not, please note that reservations were required and are now closed. We had a tremendous response and we cannot accommodate any more participants. On June 22 (rain date June 23) we will be exploring both bedrock and surficial geology of the Lakes Region of Central New Hampshire. Look for photos and a write-up in our next newsletter.

Attendees - Arrive by 8 AM on June 22, at **Ellacoya** State Park Beach's Pavilion, ([43°34'27"N 71°21'22"W](https://www.google.com/maps/place/43°34'27\)), Route 11, 280 Scenic Drive, Gilford. Bring **cash** for the lunch you ordered so we can send a person out, or bring your own lunch. There will be 3 or 4 stops in the morning, lunch at Ellacoya Beach Pavilion with sodas and water provided by the GSNH, 3 or 4 stops in the afternoon and done near 4 pm. Wear clothing suitable for a hike and bring water, sun-block, bug spray. Be

prepared to **carpool** by bringing a multi-passenger vehicle or linking up with someone at the Pavilion. Look on the GSNH website for the **field guide** and Google Earth .kmz files to study up before the trip. In case of a storm, check www.GSNH.org for trip status, but we will go in rain.

35 YEARS OF COLLECTING ON DISPLAY AT MCAULIFFE-SHEPARD DISCOVERY CENTER



Mineral collector, Tom Mortimer, has been collecting for over 35 years and his expansive collection of New Hampshire Minerals is now at the McAuliffe-Shepard Discovery Center. Browse through the 255 of 294 known mineral species found in New Hampshire on the interactive touch screen and view the corresponding sample lit up in the display. The New Hampshire's Mineral Treasures display is generously on loan from the Mortimer Family Trust. Find more information about the exhibit and all of the New Hampshire mineral species at <http://www.mindatnh.org/>. From <http://www.starhop.com/education-and-exploration/exhibits.aspx>.

BOOK DESCRIPTION: THE ROCKS DON'T LIE: A GEOLOGIST INVESTIGATES NOAH'S FLOOD by David R. Montgomery (Publication Date: August 27, 2012)

How the mystery of the Bible's greatest story shaped geology: a MacArthur Fellow presents a surprising perspective on Noah's Flood. In Tibet, geologist David R. Montgomery heard a local story about a great flood that bore a striking similarity to Noah's Flood. Intrigued, Montgomery began investigating the world's flood stories and—drawing from historic works by theologians, natural philosophers, and scientists—discovered the counterintuitive role Noah's Flood played in the development of both geology and creationism. Steno, the grandfather of geology, even invoked the Flood in laying geology's founding principles based on his observations of northern Italian landscapes. Centuries later, the founders of modern creationism based their irrational view of a global flood on a perceptive critique of geology. With an explorer's eye and a refreshing approach to both faith and science, Montgomery takes readers on a journey across landscapes and cultures. In the process, we discover the illusive nature of truth, whether viewed through the lens of science or religion, and how it changed through history and continues changing, even today. Find it on Amazon at http://www.amazon.com/The-Rocks-Dont-Lie-Investigates/dp/0393082393/ref=pd_sim_b_4

SUNKEN FOREST RAISES QUESTIONS ABOUT CLIMATE CHANGE

By **Joey Cresta** jcresta@seacoastonline.com March 23, 2013 2:00 AM

RYE — The Sunken Forest by name alone exudes mystery, but the increasing frequency of its appearances in recent years may be a portent of things to come along New Hampshire's coast. On March 8, a late winter storm battered the coastline, hurling massive waves against beaches and over sea walls. As the enormous high tides raged for days, the surf caused its fair share of damage, but also unearthed a hidden beauty beneath the sands at the northern end of Jenness Beach in Rye.

Stumps and logs of cedar and pine trees, thousands of years old and known locally as the Sunken Forest, are the remnants of a forest that may once have stretched out to the Isles of Shoals. Wendy Lull, the president of the Seacoast Science Center at Odiorne Point, said, "At one point, there were trees that grew from where the coast is now to the Isles of Shoals, which is about nine miles out."



"Pickled" trees stumps about 3,600 years old can be seen in the northern end of Jenness Beach in Rye as a result of recent storms.

Ioanna Raptis/iraptis@seacoastonline.com

Mike Labrie, who lives on the beach and serves as a beach commissioner for the town, said it seems the Sunken Forest is visible more often than it was in the past. He said it used to appear only on rare occasions, but he has seen it at least three times in the past 10 years. Records indicate it was seen in 1940, 1958, 1962 and 1978.

Wendy Lull said the stumps may be sending a message. Their visibility is one of the consequences of the changing weather dynamics and a reminder that so-called "100-year storms" are happening now far more frequently than once a century, she said.

<http://www.seacoastonline.com/articles/20130323-NEWS-303230320>

Anyone with website experience who would like to help revamp our GSNH website, please contact Bill Abrams-Dematte at Bill.Abrahams-Dematte@aecom.com or C 603-801-6583.

STABILIZING THE SUNCOOK: PACIFYING A RIVER RUN AMOK

Since 2006, the Suncook River has been on a different course: it jumped its bank in the Mother's Day flood, and the state has been trying to stabilize it ever since. Now as part of a recent fine for filling wetlands, a gravel company will give the project 8,000 tons of stone for the project. But this is only part of a continuing effort to live next to a changing river.



Once the site of a lazy meander in a slack river, the site of the avulsion is now a scene of massive erosion and change. *(Credit Sam Evans-Brown / NHPR)*

One Flood, Long-Lasting Impacts

Today, visiting the old course of the Suncook, unless you have a trained eye, it's hard to tell that a river used to run here: trees and grass have sprouted up.

But walk to the edge of where the river now runs, and the contrast is stark. The old course is maybe forty feet across, but the new river bed is massive. "Now we're looking several hundred feet across to the east bank of the Suncook River as it's shifting through the sands," says Steve Landry, DES watershed manager, surveying the scene.

When the river took its shortcut, it was suddenly dropping the same amount of elevation in a much shorter distance. So the water sped up, and faster water carries more sand and clay particles with it.

If you visit the river now, the effects are obvious: the channel has dropped more than ten feet, as the faster water has eaten away at the sandy river bottom, and there are places where the banks continue to slide into the river.

All that sand has to go somewhere. According to US Geological Survey scientist Robert Flynn, it's all downstream, in Allenstown. "Because of the movement of the sediment downstream, that's increased the frequency of overbank flooding," Flynn explains. And those living the in by the river have certainly noticed that increased flooding.



Steve Landry surveys what has come to be called the "avulsion riffle" - a short rapid just upstream of where the river jumped its bank. As the river works to find an easier way over the rocks here, it is eroding the far bank, toppling trees and taking property from landowners.
(Credit Sam Evans-Brown / NHPR)

Still More Work Needed

After the river's level dropped, those Route 4 bridge footings aren't rooted deep enough, and since the entire Suncook River valley is almost entirely sand, there's nothing to stop the river from moving again in another flood. That could trigger another chain reaction of erosion, and undermine the bridge.

"With unlimited funds we would probably replace that bridge, and build a valley spanning bridge so the river can migrate where it wants to," says Nick Nelson a river scientist with Interfluve, the consulting firm working with the state to stabilize the Suncook.

But that would cost the state as much as \$15 million and the bridge is relatively new. With many red-listed bridges around the state, replacing bridges still in good-shape is not in the cards. By contrast, it would only cost around \$3 million to line the river bank with big stones that can't be washed away. And that plan just got a boost, after Torromeo industries was ordered to donate \$330,000 dollars' worth of stone to the state for a wetlands violation.

Unfortunately, it's a solution that isn't particularly good for the river habitat. "It's a compromise, really, that it's not a typical river restoration project, period. It's a stabilization project," explains Steve Landry.

<http://nhpr.org/post/stabilizing-suncook-pacifying-river-run-amok>

MEMBERSHIP RENEWAL

If you don't remember whether you paid your dues, then you probably haven't. Please renew your membership for 2013 with the [one-page membership form, conveniently available on our website](#) or near the end of this newsletter. Check your status with Doug Allen at dallen@HaleyAldrich.com.

MEXICO'S POPOCATEPETL VOLCANO ERUPTS

<http://photos.denverpost.com/2013/05/15/photos-mexicos-popocatepetl-volcano-erupts/#1>

Mexico's Popocatepetl volcano spewed a new column of ash late Tuesday, May 14, 2013, with some of the material falling on three towns while glowing rocks landed on the towering mountain's slope. Authorities have raised the alert level to "Yellow Phase Three," the fifth of a seven-stage warning system, restricting access to an area of 12 km around the volcano while preparing evacuation routes and shelters.



Legend of Popocatepetl

Iztaccíhuatl's father sent Popocatepetl to war in Oaxaca, promising him his daughter as his wife if he returned (which Iztaccíhuatl's father presumed he would not). Iztaccíhuatl's father told her that her lover had fallen in battle and she died of grief. When Popocatepetl returned, and discovered the death of his lover, he committed suicide by plunging a dagger through his heart. God covered them with snow and changed them into mountains. Iztaccíhuatl's mountain was called "La Mujer Dormida, (the "Sleeping Woman"), because it bears a resemblance to a woman sleeping on her back. Popocatepetl became the volcano Popocatepetl, raining fire on Earth in blind rage at the loss of his beloved.

U.S. FEMALE GEOSCIENCE DEGREE RATES IN ATMOSPHERIC SCIENCE, GEOGRAPHY, GEOSCIENCE AND OCEAN SCIENCE, 2000-2012

Decreases in female enrollments and awarded degrees in the geosciences were reported recently. This led to an investigation of the rates of awarded degrees to females in different geoscience fields--atmospheric science, geography, geoscience/geology, and ocean science. Thanks to data collected by the Association of American Geographers and the Consortium for Ocean Leadership, this Currents compares the rates of conferred degrees to females in these four different fields from 2000-2012. For more information, see Currents #71.

<http://www.agiweb.org/workforce/currents.html>

...AND WE'RE ALL STILL LOOKING UP AFTER TEN YEARS



A paper coauthored by Brian Fowler from the 2009 NEIGC fieldtrip called, "Post-Glacial Mass Wasting in Franconia Notch, White Mountains, New Hampshire" discusses the collapse and an older, larger rock fall in 1997. The paper will be posted on the GSNH website soon.



On May 3, 2013, a 10th anniversary tribute was held for the Old Man of the Mountain. A moment of silence at noon followed by remarks from Legacy fund President Dick Hamilton marked the occasion at the gathering held from 11:30 to 12:30. The Society expects its paver showing the GSNH name, logo and "PROMOTING GEOLOGICAL SCIENCE & EDUCATION" will be placed in the plaza soon. [Photo from Lee Wilder] <http://www.oldmanofthemountainlegacyfund.org/>

WHAT IS YOUR BOARD DOING? By Lea Anne Atwell

Lee Wilder hosted the GSNH quarterly Board meeting at the Harold Martin School in Hopkinton on June 6th. The Board approved acting as Friends of the Madison Boulder for the purpose of managing the fund earmarked for upgrades to the road, the gate, and signs at the site (see full article below for more details). The Membership Committee reported that there are 199 active GSNH members! We also discussed ways to support Steve Shope, a GSNH member, injured in a mountain bike accident in April. We are planning to collect donations at the October dinner meeting to support his recovery efforts.

The Communications Committee is working to update our website with links to geological websites of interest – look for an update soon! Doug Allen is working on a Facebook page for GSNH – we will send out an announcement when it goes live. The Education Committee reported that the Chesterfield Gorge brochures are complete, and that educational panels are being prepared for the Old Man in the Mountain Museum, which will be opening on June 28th.

Doug Allen will host the next GSNH Board meeting at 6pm September 5th at the HALEY & ALDRICH offices, 3 Bedford Farms Drive in Bedford.

MADISON BOULDER UPDATE

To date the GSNH has been involved with the upgrades at the Madison Boulder Site. Brian Fowler (also of GSNH) has been the person behind much of the Madison Boulder efforts. These efforts have been in cooperation with State Parks who now has clear title to the Madison Boulder Site (MBS). State Parks has had, and continues to have, little money for such projects. However, through Brian's efforts, funds for work at the MBS have come in from several sources. Currently those funds are in an account with the Town of Madison.

The rest of the current projects to be completed at the MBS, include road work and signage. Those projects need access to the funds currently held by the Town. The Town (and State Parks) is looking to have a group be "The Friends of the Madison Boulder." Friends groups, as a 501-C(3), can hold funds for such purposes. Having been "involved" to date with the Madison Boulder, the GSNH would make a logical "Friends of the Madison Boulder" group.

GSNH would hold the funds in a separate account and expend them as needed over the next 6-8 months as the hired work at the MBS is completed. Once the projects are finished and the balance of the funds are expended, there would be no further involvement on our part. Brian and Lee could "manage" the GSNH-Friends of the Madison Boulders affairs, maybe as a specific Madison Boulder committee, so there would be little additional work for the current GSNH Board to do.

The GSNH Board voted at the June Board meeting to take on this role as "Friends of the Madison Boulder" in order to manage the funds for the site improvements.

STREAM GAGES MAY BE CUT DUE TO SEQUESTER

This spring NH-VT USGS posted a notice on its stream gage webpages noting expected losses to the nation's stream gage network due to sequestration and other funding losses. Currently, USGS cost shares with NH DES at about 50:50, but as of October 2013, this will drop to 44:56. Each gage requires about \$15,000 to maintain each year. The State FY14 budget for gages is currently about \$8000 short, if the legislature approves the current budget figures. However, even the lack of a small amount funding can result in the loss of a whole position at USGS which results in the loss of several gages. NH gages that are candidates for closing without new funding sources are

- 010642505 Saco R at Bartlett, NH
- 010735562 Exeter R nr Sandown, NH
- 01130000 Upper Ammonoosuc River nr Groveton, NH
- 01154950 Cold River at Alstead, NH
- 01157000 Ashuelot R at Gilsum, NH

USGS expects to discontinue operation of up to 375 stream gages of over 8,000 stream gages nationwide.

THE GEOLOGIC MYSTERY OF PULPIT ROCK BY RICHARD B. MOORE

[Special to the Bedford Journal - Friday, April 26, 2013]

<http://www.cabinet.com/bedfordjournal/bedfordnews/1001562-308/the-geologic-mystery-of-pulpit-rock.html>

In 1988 on my first trip to Pulpit Rock, my father-in-law, Harry N. Tufts, challenged me. He said, "You're a geologist with an interest in glacial geology, why don't you figure out what caused the formation of Pulpit Rock?"

At the time I thought that I never would, but five years later I was defending my research before groups of scientists who study the geology of the Ice Age and ancient floods.

At the end of May 1993, more than 60 geologists from universities, private companies and government gathered in Concord for the 56th annual meeting of an organization known as the Friends of the Pleistocene. The Pleistocene is the name given by geologists to the Ice Age.

The group examined sites that illustrate the history of the area during the time about 14,000 years ago when the last great glacier here was melting back (retreating) to the north. The two-day conference, held May 22 and 23, 1993, took participants to 11 sites, mainly in the Contoocook and Piscataquag River basins of southwestern New Hampshire. The conference, organized by Carol Hildreth of the New Hampshire State Geologist's Office and myself of the U.S. Geological Survey, then culminated with a visit to Pulpit Rock.

To understand the geologic explanation for why so much sediment-laden meltwater emerged from the glacier and carved out the huge pothole known as Pulpit Rock, one needs to look westerly to the Contoocook River Basin.

The Contoocook River basin is the largest river basin that drains north in New Hampshire and is similar to northwardly draining parts of the Piscataquag and Souhegan River basins. It is of special interest to glacial geologists because at least eight different glacial lakes formed and drained successively in the basin as the glacier melted back to the north.

During the retreat of the ice, the drainage divide between adjacent drainage basins acted as a dam, and lakes formed behind it, trapped between the glacial ice and the land. At first, as the glacial margin melted back (northward), two small lakes formed successively and then filled in with sediment. As the glacial ice continued to melt farther northward, new outlets were uncovered at lower altitudes along the drainage divide. This resulted in catastrophic draining of the lakes, catastrophic because the lakes drained very rapidly as the new outlets were exposed.

Of particular interest to the residents of Bedford is that this complex history of the formation of successive glacial lakes finally provides us an explanation of how "the Pulpit" was carved.

This huge pothole is similar to the Basin at Franconia Notch, but the Pulpit is much larger. Although it is partly buried by sediments, the exposed part measures 42 feet high and about 23 feet wide. One wall has part of a cavity in it that is said to resemble a pulpit and gives the place its name.

The Pulpit developed at the base of a cascade or waterfall where swirling water filled with sediment eroded the pothole. The swirling slurry of water and sediment, including sand and gravel, acted like "liquid sandpaper" carving the pothole out of the bedrock. The circular basin was thus eroded into the bedrock, as were several smaller potholes downstream from the Pulpit.

Today's Pulpit Brook only drains less than 1 square mile above Pulpit Rock. But for a time during the Pleistocene and the retreat of the glacier, it drained two huge lakes to the west in the Contoocook and Piscataquag River basins.

At that time, the lake in the Contoocook drainage basin (now much of Peterborough, Greenfield and Hancock) drained into the lake in the South Branch of the Piscataquag drainage basin (New Boston), which then drained out to Pulpit Rock. The lake level of the lower of the two lakes was about 100 feet higher in altitude than the top of the Pulpit.

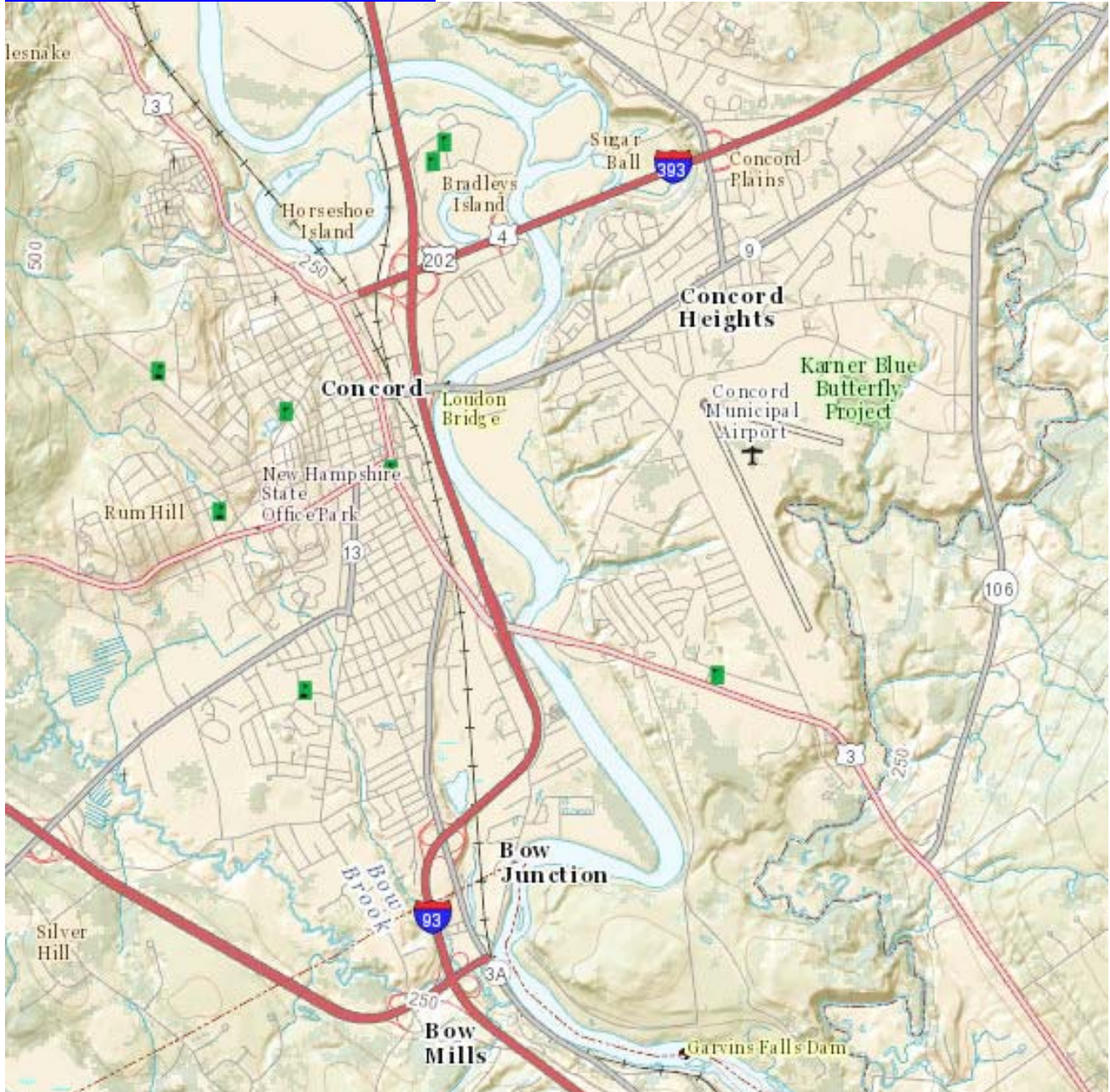
This provided the hydraulic pressure for the swirling water that exited, with an enormous amount of energy, from the glacial ice margin at the Pulpit. And thus the mystery was solved.

[To those who have not yet visited it, the Pulpit Rock Conservation Area, established in 1981, is located in the western part of Bedford on New Boston Road. Pulpit Rock itself is a half-mile walk in from the road on a rough but well-marked path.]

Richard Moore, of Bedford, is chairman the Pulpit Rock Subcommittee of the Bedford Conservation Commission.

THE NATIONAL GEOLOGIC MAP DATABASE

"Topoview" highlights one of the USGS's most important and useful products, the topographic map. In 1879, the USGS began to map the nation's topography. This mapping was done at different levels of detail, in order to support various land use and other purposes. As the years passed, the USGS produced new map versions of each area. The most current map of each area is available from the national map. Topoview shows the many and varied older maps of each area, and so is especially useful for historical purposes—for example, the names of some natural and cultural features have changed over time, and the "old" names are shown on these historical topographic maps. Go to <http://ngmdb.usgs.gov/maps/TopoView/>.



Anyone with website experience who would like to help revamp our GSNH website, please contact Bill Abrams-Dematte at Bill.Abrahams-Dematte@aecom.com or C 603-801-6583.

TECHNOLOGY REVOLUTIONIZES GEOLOGIC METHODS - Submitted by Tina Cotton

Do you remember paper maps, field notebooks, scales, protractors, and compiling and analyzing the data sometime later? Do you remember answering stock workbook questions from hypothetical maps? Digital technology using tablets and iPads is replacing traditional tools for mapping and analysis.

At Lafayette College, professors have developed a digital app field notebook that has windows for recording strikes, dips, contacts, bedding, faults, joints, georeferenced photos, and other observations. Date, time, and lat/long are recorded with the GPS app. Symbols are color coded for rock type, texture, relative age, or other differentiations. The information is displayed on digital topographic, relief, or satellite maps and analyzed using GIS, Google Earth, Stereonet, spreadsheet, and drawing programs. By zooming in, many symbols can be displayed on a single outcrop, pit, or vertical face. Data can be exported for subsequent analysis; geologic contacts and labels are added using Adobe Illustrator. Maps can be viewed in cross-section and stereoplots. Layers turned on and off enable the viewing of various geologic relationships.

Using georeferenced photos and Google Earth, Mid-Atlantic Geo-Image Collection (M.A.G.I.C.), and other software tools, professors have created virtual field trips for students from which structural and other geologic questions can be asked. Archived specimens, type localities, fossils, rocks, minerals, and crystals can be georeferenced and viewed interactively using Autodesk 123 Catch. A minimum of 40 photographs viewed from all possible angles need to be taken, preferably with background intact. Editing to remove the background is done within Catch or MeshLab and then georeferenced into Google Earth terrain. The New Jersey Geological and Water Survey is using SketchUp, Excel, and borehole televiewer records to view 2-D and 3-D subsurface information referenced on Google Earth.

Other digital apps and programs worth exploring may include Google Fusion for tables and Avenza Systems for maps. Also worth exploring are Filemaker Go; Dynamic Digital Maps from the University of Massachusetts, Amherst; and Google Earth Engine for Landstat imagery. Sketchfab is a PERL script developed at James Madison University to enable 3-D animation and rotation of polygons in Google Earth.

Further information is available from the presenters at the Northeastern GSA meeting, March 19, 2013 session number 52 entitled Innovations in Geoscience Education and Research Using Google Earth and Related Digital Technologies.

COURSE INFORMATION: GEOMORPHIC AND ECOLOGICAL FUNDAMENTALS FOR RIVER AND STREAM RESTORATION

August 5-9 2013 at Sagehen Creek Field Station, Truckee, California

<http://sagehen.ucnrs.org/courses/geomorph.htm>

This five-day introductory course emphasizes understanding geomorphic and ecological process as a sound basis for planning and designing river restoration, covering general principles and case studies from a wide range of environments. Incorporating insights from recent research in fluvial geomorphology and ecology, the course emphasizes developing predictive connections between objectives and actions, learning from built restoration projects, and developing restoration strategies and innovative management approaches to address underlying causes of channel or ecosystem change, rather than prescriptive approaches.

With on-site lodging, the total cost including lodging, all meals for five days, registration, course materials, text, and continuing education credit from University of California is an excellent value at only \$2,200 inclusive for the week.

The course is taught by leading researchers and practitioners, who are applied scientists focusing on bringing science together with practice to solve typical environmental problems. The course brings cutting-edge expertise and methods to bear on planning, design, and evaluation of river restoration. Collectively, the instructors have broad experience on rivers in North America, Europe, and Asia, including analysis and project design in the Lake Tahoe basin and throughout California. For more information and registration details <http://laep.ced.berkeley.edu/courses/riverrestoration/>.

GSNH TRACKED LEGISLATION - from Russ Wilder and Tom Fargo

Here are current bills in the NH Legislature that may be of interest to GSNH Members. If GSNH members know of other bills that we should keep an eye on, please notify Russ Wilder at russwilder@msn.com. We will monitor how these legislative initiatives fare with the new makeup of the legislature. If members are aware of specific legislation that they would like tracked, they should send information to me at Russ.Wilder@URS.com and RussWilder@msn.com.

Active Bills as of May 22, 2013

HB 416 Shortening the appeals process for a permitting decision under RSA 482-A, relative to fill and dredge in wetlands by removing the requirement to request reconsideration. Prime sponsor: Christopher Ahlgren. Passed House. Introduced and Referred to Senate Energy & Natural Resources. Senate Enrolled. House Enrolled

SB 12 Relative to protection and preservation of significant archeological deposits. This bill authorizes the adoption of optional provisions for the protection or preservation of archeological resources in master plans, subdivision regulations, and site plan review regulations. Prime Sponsor: Nancy Stiles. Passed Senate. Introduced and Referred to House Municipal and County Government. House Enrolled. Senate Enrolled

SB 124 Establishing an integrated land development permit. Prime sponsor: Bob Odell. Passed Senate. Introduced and Referred to House Resources, Recreation and Development. Amendment #1501h: AA VV. Ought to Pass with Amendment #1501h: MA RC 218-137. Referred to Finance. Division I Work Session: 5/21/2013 10:30 AM LOB 212. Executive Session: 5/29/2013 10:00 AM LOB 210-211

HB 184-FN Relative to the oil discharge cleanup funds. Prime sponsor: Leigh Webb. Passed House. Introduced and Referred to Senate Energy & Natural Resources. Ought to Pass: MA, VV; OT3rdg;

HB 185-FN Relative to the fuel oil discharge cleanup fund. Prime sponsor: Leigh Webb. Passed House. Introduced and Referred to Senate Ways & Means. Committee Report: Ought to Pass, 5/23/13; SC21

HB 513 Relative to the shoreland protection act. This bill includes a requirement for NHDES to get permission from the landowner in advance of a compliance inspection. Prime sponsor: Judith Spang. Passed House. Introduced and Referred to Senate Energy & Natural Resources. Committee Amendment 1393s, AA, VV; Sen. Bradley Floor Amendment #2013-1482s, AA, VV; Ought to Pass with Amendments 1393s, 1482s, MA, VV; OT3rdg

HB 634 Relative to water resource plans in municipal master plans. This bill permits a municipality:
I. To include in its master plan a local water resource management and protection plan.
II. To adopt ordinances and enter into agreements with other municipalities to develop and implement regional water plans

Prime sponsor: Judith Spang. Passed House. Introduced and Referred to Senate Public & Municipal Affairs. Committee Report: Ought to Pass with Amendment #2013-1625s, 5/23/13; Vote 5-0; CC; SC21

SB 163 (New Title) Establishing a commission to recommend legislation to prepare for projected sea level rise and other coastal and coastal watershed hazards. Prime sponsor: David Watters. Passed Senate. Introduced and Referred to House Resources, Recreation and Development. Amendment #1367h: AA VV. Ought to Pass with Amendment #1367h: MA RC 228-124

Retained Bills

HB 114 Relative to abutter access over subdivided land. This bill requires a developer to deed an easement to an abutting owner of property with no legal access under specified conditions. Prime sponsor: James Belanger. Introduced 1/3/2013 and Referred to Municipal and County Government. Retained Bill - Subcommittee Work Session: 5/15/2013 11:00 AM LOB 301

HB 568 Requiring new electric transmission lines in New Hampshire to be buried. Prime sponsor: Laurence Rappaport. Introduced 1/3/2013 and Referred to Science, Technology and Energy. Retained in Committee

Killed Bills

HB 377 Relative to archeological investigations on private or public property. This bill prohibits archeological investigations on properties unless the division of historical resources determines there is concrete evidence that historic resources exist at the property. Prime Sponsor: Harry Merrow. Introduced 1/3/2013 and Referred to Executive Departments and Administration. Inexpedient to Legislate: MA VV

SB 167 Relative to groundwater. This bill deletes large groundwater withdrawals as an exception to the authority of municipalities to enact local ordinances and regulations affecting groundwater. Prime sponsor: John Reagan. Introduced and Referred to Energy and Natural Resources. Inexpedient to Legislate, RC 22Y-1N, MA

DATES TO REMEMBER

June 22, 2013 – NH GEOLOGICAL SOCIETY SUMMER FIELD TRIP - Bedrock and Surficial Geology of the Lakes Region of Central New Hampshire - Dan Tinkham and John Brooks, Trip Leaders. Starts at 8 AM at Ellacoya State Park Beach, 280 Scenic Drive, Gilford, NH for those who signed up. Sorry reservations are now closed.

June 22-23, 2013 - GILSUM ROCK SWAP AND MINERAL SHOW at the Gilsum Elementary School grounds on Route 10 in Gilsum. 8:00 AM to 6:00 PM Saturday and 8:00 AM to 4:00 PM Sunday with the annual ham and bean dinner with all-you-can-eat home-made pies and a chicken barbeque. Admission is free, although donations are graciously accepted. All proceeds go to youth recreation and community programs. For more information, please contact Robert Mitchell at the Gilsum Recreation Committee, P.O. Box 76, Gilsum, NH, 03448; call 603.357-9636; or send e-mail to gilsumrocks@gmail.com.

September 5, 2013 – GSNH BOD meeting at 6pm at the HALEY & ALDRICH offices, 3 Bedford Farms Drive in Bedford.

September 9-12, 2013 - The **2013 HIGHWAY GEOLOGY SYMPOSIUM** will be held in Conway, NH. <http://www.highwaygeologysymposium.org/History.asp>

October 17, 2013 – GSNH FALL MEETING at Makris Lobster House.

October 13-19, 2013 EARTH SCIENCE WEEK 2013 - Earth Science Week 2013. ESW will promote awareness of the many exciting uses of maps and mapping technologies in the geosciences. "Mapping Our World," the theme of ESW 2013, engages young people and the public in learning how geoscientists geographers, and other mapping professionals use maps to represent land formations, natural resource deposits, bodies of water, fault lines, volcanic activity, weather patterns, travel routes, parks, businesses, population distribution, our shared geologic heritage, and more. Maps help show how the Earth systems – geosphere, hydrosphere, atmosphere, and biosphere – interact. <http://www.earthsciweek.org/>

THE NH GEOLOGICAL SURVEY GROUND WATER LEVEL NETWORK SUMMARY

Submitted by the NHGS

March 2013 NH Groundwater level measurements were collected by the NH Geological Survey from March 26 – April 1, 2013. The statewide March 2013 average groundwater level for wells in the overburden (soil on top of the bedrock) showed an increase of +0.49 feet from February 2013. When compared with March 2012, the statewide average groundwater level for March 2013, in these wells, decreased - 0.62 feet. The March 2013 average groundwater level in the new bedrock wells

showed an increase of + 0.34 feet when compared with February 2013. When compared with March 2012, the bedrock wells showed a decrease of – 1.22 feet for March 2013.

April 2013 NH Groundwater level measurements were collected by the NH Geological Survey from April 24 – April 30, 2013. The statewide April 2013 average groundwater level for **wells in the overburden** (soil on top of the bedrock) showed an increase of +0.46 feet from March 2013. When compared with April 2012, the statewide average groundwater level for April 2013, in these wells, increased +0.37 feet. The April 2013 average groundwater level in the new **bedrock wells** showed a decrease of -0.18 feet when compared with March 2013. When compared with April 2012, the bedrock wells showed a decrease of – 0.32 feet for April 2013.

May 2013 NH Groundwater level measurements were collected by the NH Geological Survey from May 24 – May 31, 2013. The statewide May 2013 average groundwater level for **wells in the overburden** (soil on top of the bedrock) showed a decrease of -0.22 feet from April 2013. When compared with May 2012, the statewide average groundwater level for May 2013, in these wells, decreased -0.33 feet. The May 2013 average groundwater level in the new **bedrock wells** showed an increase of +1.22 feet when compared with April 2013. When compared with May 2012, the bedrock wells showed an increase of +0.38 feet for May 2013.

The groundwater level measurements for the deeper of the two Concord bedrock wells (CVWB-1) are not presently available in real-time. Past data are on the USGS website at: http://waterdata.usgs.gov/nh/nwis/uv/?site_no=431034071340501&PARAMeter_cd=72019. The data for all of the wells in the NH Groundwater Level Network are shared with and posted on the USGS website at: <http://groundwaterwatch.usgs.gov/StateMaps/NH.html>.

Citation for Post-Glacial Mass Wasting in Franconia Notch, White Mountains, New Hampshire - Westernman, D.S. and Lathrop, A.S. (eds.), 2009, Guidebook for field trips in the Northeast Kingdom of Vermont and adjacent regions. New England Intercollegiate Geological Conference, 101st Annual Meeting, Lyndon State College, Lyndonville, VT. 284 p.

HEADLINES FROM TWENTY YEARS AGO

Do you remember this field trip described in the June 1993 Granite State Geologist newsletter?

Family Picnic and Field Trip to the Summit of Mount Washington

The New Hampshire Geological Society's third annual summer picnic and field trip is planned for Saturday, August 7, 1993. This year we'll be going to the summit of Mount Washington, where we'll share a picnic lunch provided by the Society, tour the summit buildings and the weather observatory, and learn about Mount Washington history and geology. For those so inclined, additional scientific field trips to look at some of the unique geologic features of the Mount Washington area are also planned.

Participants may ascend to the summit by driving their own car up the Mount Washington Auto Road, riding the Cog Railway or the Mount Washington Auto Road Stagecoach, or by hiking up the mountain through Tuckerman Ravine.

Take a look at <http://www.gsnh.org/publications/TGSG.05.html> to see what else was happening.

Anyone with website experience who would like to help revamp our GSNH website, please contact Bill Abrams-Dematte at Bill.Abrahams-Dematte@aecom.com or C 603-801-6583.



MEMBERSHIP APPLICATION/RENEWAL

Geological Society of New Hampshire

PO Box 3483, Concord, NH 03302-3483

- New member
Renewing member
Check here if you have no updates to your information.

Check here if you do NOT want your information published in the directory.

Name & Home Address:

Business Name & Address:

Home Telephone
Home Fax:
E-mail:

Office Telephone
Office Fax:
E-mail:

Preferred address to receive GSNH communication: Home or Business
Quarterly newsletters are distributed electronically. Check here if you prefer a paper copy:
New Hampshire PG # (if applicable):

Education: Degrees received or in progress:

Table with 4 columns: Year, Degree, Major, College or University

I volunteer to help with one of the following committees or tasks:

- Membership Committee, Regulations Committee, Communications Committee, Legislative Committee, Education Committee, Giving a talk at a meeting, Events Committee, Other

Membership Category:

- Regular Member (Annual Dues \$20.00)
Student Member (Annual Dues \$10.00)...Please complete Education section above.

Make checks payable to "Geological Society of New Hampshire." Note that GSNH dues are not deductible as a charitable contribution, but may be deductible as a business expense.

The Society's Membership year runs from January 1 to December 31.

Signature: Date: