



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

The first day of Spring is right around the corner as I write this message or should I say the first day of “Mud Season?” There’s still snow on the ground, but the start of Daylight Savings Time means some of us can leave work while it’s still light out and that always brightens one’s spirits.

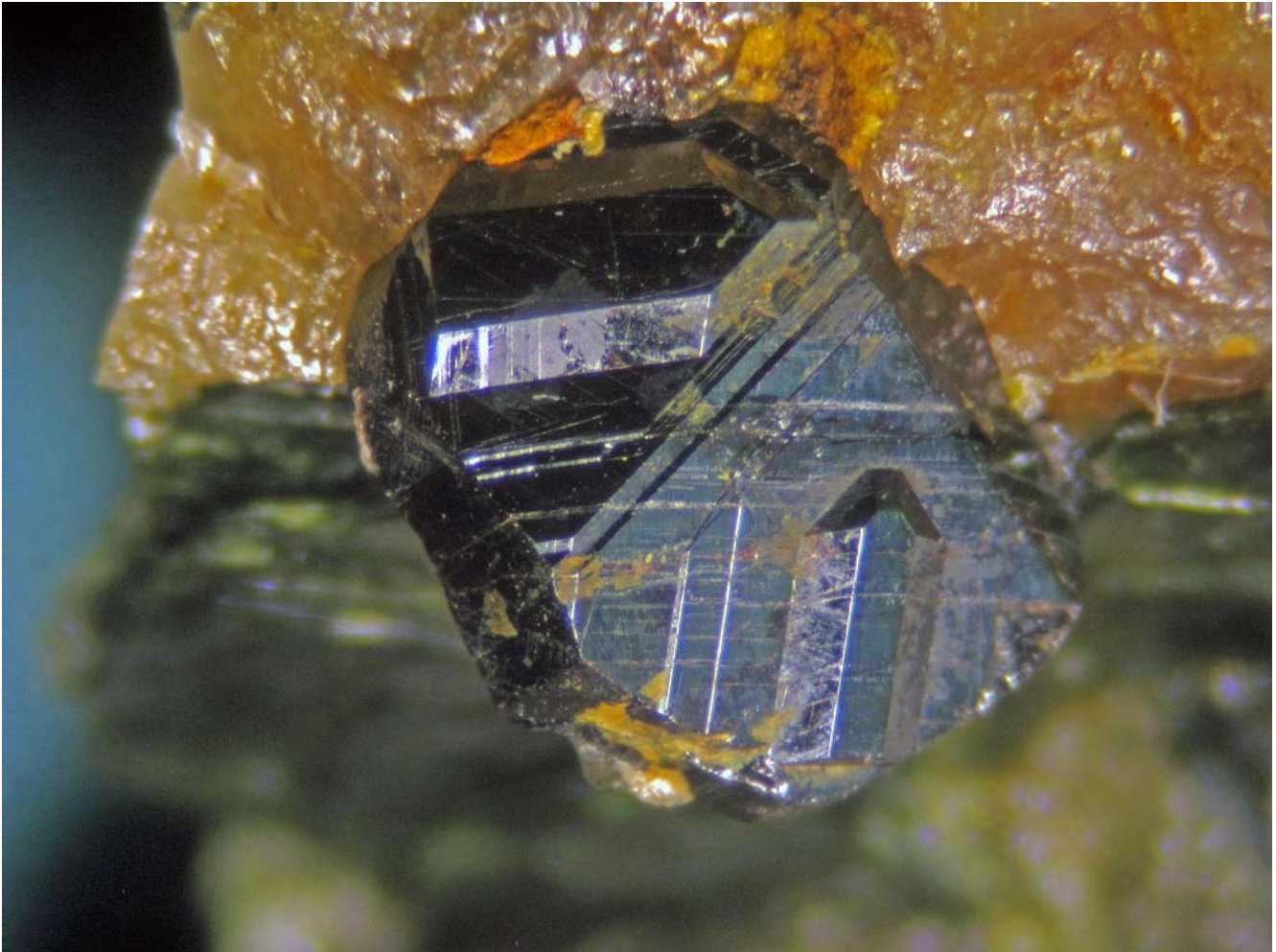
Our January meeting was an incredible success; no weather delays this year! It was almost too well attended as a flood of last minute reservations and many walk-ins threatened to exceed the capacity of the room and the capability of the kitchen to keep up with the unexpected number of mouths to feed. We can only hope that future meetings are so well attended, however, The Red Blazer and Makris are limited in seating, so the Program Committee has undertaken a search for a bigger venue to accommodate future meetings. That search has just begun and we were already reserved for The Red Blazer for the April meeting, so here’s my plea for you to **RESERVE BEFORE THE DEADLINE!** If we reach a certain point we will have to notify people that we are at capacity and will not be able to take any more reservations. Don’t let this happen to you. Please pay attention to the deadline on the meeting notice at the end of this newsletter. If you like to wait until the last minute, please email Erin Kirby of your intention to come as a walk-in because we may already be at capacity. We’d hate to have to turn anyone away, but there is actually a maximum number of people that the room will allow and we won’t be able to exceed that.

Paul Rydel’s talk at the January 16 meeting about arsenic and manganese in soil and groundwater was very well received. When these elements are detected on site, questions of whether they are naturally-occurring or release-induced must be answered. Paul’s talk provided a framework for assessment which was very useful information for the environmental consultants in attendance.

Mineral raffle prizes that evening were won by Shane Csiki (1st), Megan Murphy (2nd) and Steve Bill (3rd). Congratulations to all the winners! The historic geology texts that Lee Wilder has been finding have been such a hit that we are going to put some of the more rare ones into an expanded raffle in April. As a reminder our raffle money is earmarked for our Classroom Enhancement and Professional Development Grants for teachers, so please encourage the earth-science teachers that you know to apply for our grants.

We will have another great presentation on April 17, 2014. Membership renewals were due by the end of the year, but it's not too late to renew. There is a membership form at the end of the newsletter and you can renew when you check in at the April meeting. Remember to reserve your space early for the April meeting!

RUTILE TiO₂



Locality: Soapstone Quarry, Richmond, NH

Specimen Size: 6 mm rutile "button" crystal with secondary crystal growth on pyramid termination faces.

Field Collected: Tom Mortimer - <http://mindatnh.org/Richmond%20Soapstone%20Gallery.html>

AGI PRESS RELEASE - JANUARY 15, 2014

http://www.agiweb.org/news/15JAN2014_ESWtheme.pdf - Alexandria, VA -- The American Geosciences Institute (AGI) is pleased to announce that the theme of Earth Science Week 2014 will be "Earth's Connected Systems." This year's event will promote awareness of the dynamic interactions of the planet's natural systems. Earth Science Week 2014 will be celebrated October 12-18. See this year's web page at <http://www.earthsciweek.org/>

MEMBERSHIP RENEWAL

Woulda-Shoulda. Yes, it's passed time to renew your GSNH membership. Set your membership clock ahead by paying this year's dues. Please renew your membership for 2014 with the one-page membership form, conveniently near the end of this newsletter or available on our website <http://www.gsnh.org/membership/membership.shtml>.

HAS YOUR EMAIL CHANGED?—LET US KNOW!

THE GSNH DINNER MEETING IS

APRIL 17, 2014

MAKE YOUR RESERVATION BY EMAIL NOW!

AT RED BLAZER INN

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

Email reservations to Erin Kirby at EKirby@Geosyntec.com – LIMITED SEATING

Deadline for advance reservation price is Friday noon, April 11, 2014.

NEW GLACIOGRAM IS READY

In January, the December 2013 issue of Glaciogram (Volume 45) was published. Glaciogram is an annual publication out of NY that covers a lot of New England including upcoming events, briefings on recent work covering drumlins, age dating and work on Mars, as well as contributions from Lee Wilder and Woody Thompson. See it at http://www2.newpaltz.edu/glaciogram/Glaciograms/NYGlaciogram_2013_45.pdf. The mailing list is available at <glaciogram-l@newpaltz.edu>.



Lee Wilder And Deb Kure display the new GSNH Banner at the January 2014 meeting.
(Photo by Doug Allen)



A packed house at the January 2014 GSNH meeting at Red Blazer. (Photo by Doug Allen)

THE GEOLOGIC STORY OF THE OLD MAN OF THE MOUNTAIN Submitted by Lee Wilder

In the Spring of 2013, in cooperation with the Old Man of the Mountain Legacy Fund (www.oldmanofthemountainlegacyfund.org/), the NH Geological Survey staff and GSNH member Brian Fowler, prepared a photo essay entitled "The Geologic Story of the Old Man of the Mountain."



**The New Hampshire Geological Survey,
in cooperation with The Old Man of the
Mountain Legacy Fund,**



invites you to explore ...

The nine completed panels were installed in the Old Man Museum. You can see all of these panels at: <http://des.nh.gov/organization/commissioner/gsu/documents/oldmanmtdisplay.pdf>. The museum and gift shop are located at the head of the pathway leading to the newly constructed Old Man Plaza. This attractive plaza sits on the shore of Profile Lake in Franconia Notch State Park, NH.

VOLCANOES GUARD ICE AGE SECRETS By Becky Oskin, Senior Writer at livescience.com March 13, 2014; 10:40 AM

<http://www.livescience.com/43921-volcanoes-clues-past-ice-ages.html>

Standing eye level with oncoming lava, in a snow pit he is digging at Tolbachik volcano in Russia, Ben Edwards is hoping his world doesn't violently explode in the next few minutes.

Several years of watching lava trundle over ice and snow has taught Edwards, a volcanologist at Dickinson College in Pennsylvania, that he's probably safe - at this spot, the volcano's incandescent rock rarely sparked the kind of blasts typically seen when lava meets water.



Lava flows on top of snow at Tolbachik volcano in Russia in April 2013. Credit: Ben Edwards

Finished with the snow pit, Edwards clammers out and waits for water to start trickling out of the deep walls. "There was no obvious meltwater at [Tolbachik](#), so we think the water drains immediately from the [lava-snow] interface, down under the snow," Edwards said.

Understanding how snow-capped volcanoes generate meltwater will help scientists better predict flooding from so-called glaciovolcanic eruptions, a significant hazard. Among the worst natural disasters are massive floods from icy urban volcanoes such as Washington's Mount Rainer. In Iceland in 1996, a sudden flood called a [jökulhlaup](#) destroyed part of the national highway after Grímsvötn volcano melted its overlying glacier.

But for Edwards, working at the extremes of fire and ice means more than predicting future hazards. He is also among a handful of geoscientists pioneering a new way to make sense of past ice ages - with volcanoes that erupted through ancient ice sheets.

"These are volcanoes with unique features that we can use to understand what's happened to Earth's climate over the last 10 to 15 million years," Edwards told Live Science's Our Amazing Planet. [[Fire and Ice: Images of Volcano-Ice Encounters](#)]



Digging a snow pit near a lava flow at Russia's Tolbachik volcano in April 2013.

Credit: Ben Edwards

When fire meets ice Most of [Earth's climate history](#) comes from the ocean floor, from chemical signatures preserved in mud and microscopic sea creatures. Drilling into the seafloor rewards researchers with cores holding millions of years of natural temperature swings. (Even during an ice age, [Earth's temperature](#) shifts back and forth a little bit.) But matching these mucky cores to glacial advances and retreats on land is complicated by the glaciers themselves.

Like giant erasers, [glaciers](#) scour away much of their record of past movement as they shrink and grow. In North America, only the last few glacial cycles can be found by geologic detectives. And the rubbly piles left behind may be impossible to pin down with an accurate age, which is key to matching glacial history to ocean climate records.

Enter the weird volcanoes called tuyas.

Tuyas are like little pushpins marking where and when ice covered the land. Though each [tuya volcano](#) may have erupted thousands of years apart, reconstructing their history is yielding new insight into the advance and retreat of continental ice sheets.

"They act as tide marks of vanished ice, and this information doesn't exist in any other form," said Dave McGarvie, a volcanologist at the Open University in Scotland.

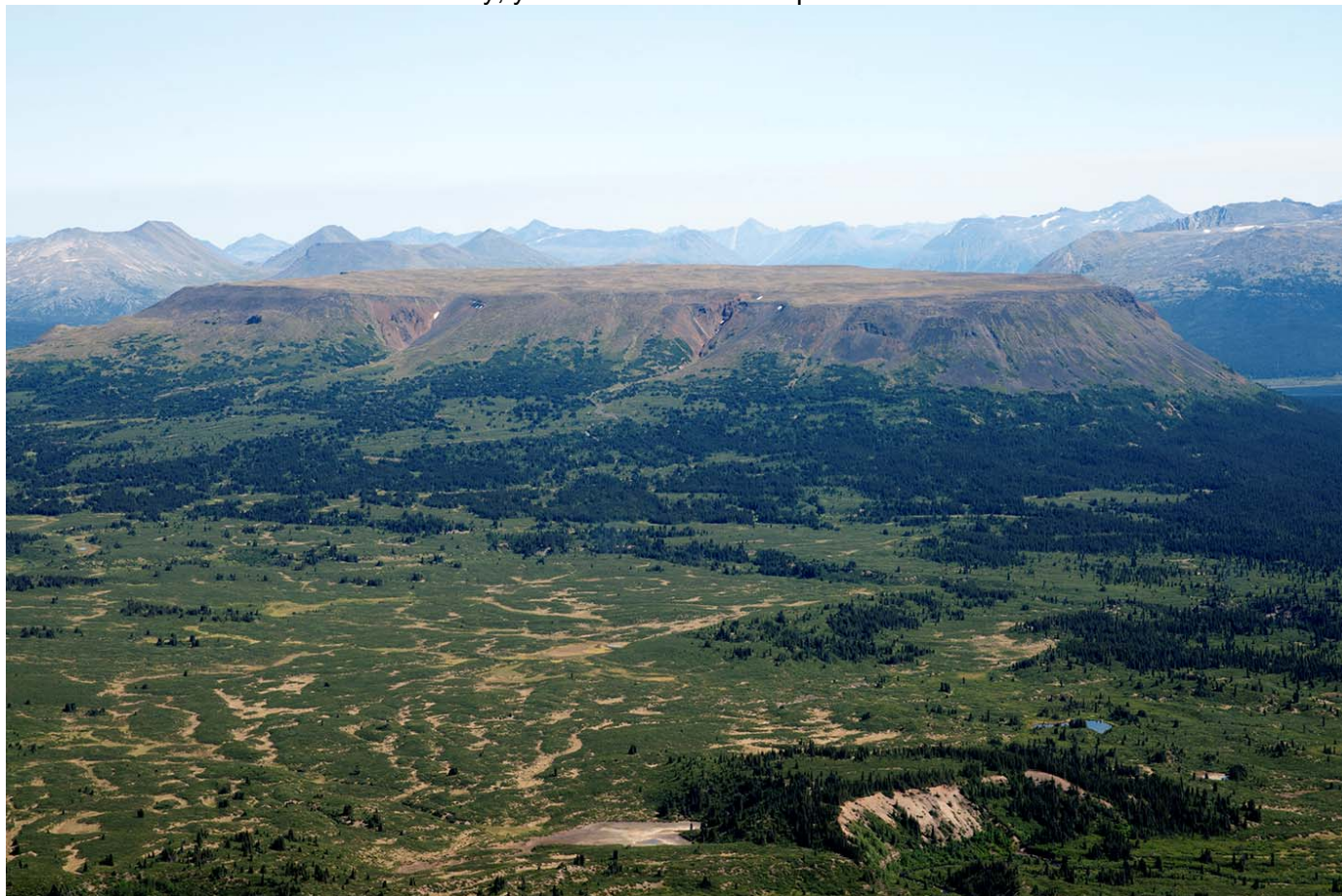
Picture a volcano that looks like a towering bakery cake, with steep sides and a flat top. To those with a trained eye, the bottom layers obviously formed underwater. The rocks are bulbous pillow lavas and exploded lava glass, called hyaloclastite. But the frosting on top is a normal-looking lava flow, like those that cool in air.

In the 1940s, a Canadian geologist first figured out how this strange stack of rocks appeared. The flat-topped volcano, called Tuya Butte, erupted underneath a long-gone ice sheet that once covered much of British Columbia. First, the volcanic heat thawed the ice, producing the bottom layers, called pillow lavas. As the ice thinned and a small meltwater lake formed, the overlying pressure lessened, and the lava had room to explode.

"One bit of basalt can melt about 10 to 14 times its own volume of ice, so you get a lot of water appearing very, very quickly during an eruption," McGarvie said.

The confining ice kept everything piled up into a steep-sided hill. When the volcano was tall enough to burst through the ice sheet, the [lava](#) could cool in the air, creating the flat top. (If enough lava pours out, the volcano will build a traditional cone shape on top.)

"Imagine this amazing-looking island sitting in this moat of water surrounded by an ice wall," McGarvie said. "When it all melts away, you're left with a flat-top mountain."



Tuya Butte, the volcano in northern British Columbia that is the source of the term ‘tuya’ — a volcano that erupted under ice. Credit: Ben Edwards

Frozen in time The beauty of tuyas is that their hard rock preserves the height of the ice sheet, even though glaciers may grind away at the volcano. The transition from the waterline to aerial lavas is like the ring left on the inside of a bathtub. And tiny minerals in the lavas provide a precise age.

"Every time a volcano erupts it gives you a photograph of the ice," said John Smellie, a volcanologist at the University of Leicester in the United Kingdom.

In western Canada, where scores of volcanoes erupted in the past millennia, geoscientists are quilting together the past thickness of the North American ice sheet with lava, and linking it to ocean cores. For example, ocean cores are often correlated by changes in oxygen isotopes (atoms with different numbers of neutrons) in ocean sediments. Edwards can now point to a volcano in British Columbia and say the ice on land was at least 300 meters [985 feet] thick during a certain marine isotope stage that corresponds to a cold Earth.

"With these volcanoes we have 2 million years of records," Edwards said. "We have some volcanoes that erupted 10 to 15 times. It's not continuous, but we can start to think about whether the ice was always the same thickness," he said.

"This is important for people doing big-scale [climate](#) models, because there's really not much of a check on their models for ice sheets growing and disappearing. These kind of studies

provide points that modelers can use, and they darn well better have ice that's a kilometer thick in B.C. volcanoes," Edwards said.

In Iceland, where tuyas are called table mountains, glacier-volcano records can also provide a chronology of the ice sheets immediately south of the Arctic Circle, McGarvie said. More than half of Iceland's glaciers lie nearby or flow directly over volcanoes today.

McGarvie is also scaling volcanoes in Chile to estimate the past thickness of tropical ice and link it to the marine climate record. Part of the [Patagonian ice field](#), the glaciers were once more extensive and scientists think their expansion and contraction provides a sensitive record of past climate change.

The original G-V And in Antarctica, home to most of Earth's glaciovolcanoes, past eruptions have resolved one of the thorniest ice sheet debates in recent decades, Smellie said.

"For 30 years people have argued for when the East Antarctic Ice Sheet made the transition from a relatively warm and movable ice sheet to its relatively cold and stable state," Smellie told Live Science's Our Amazing Planet.

Why does this matter? An ice sheet with a warm bottom can respond more quickly to a warming climate, meaning East Antarctica's massive glaciers might soon shift into fast-flowing mode, rapidly raising sea levels.

Smellie and his colleagues looked at the ice sheet's past history during warmer and colder climate swings by examining volcanic rocks in Victoria Land, which includes a large segment of the Transantarctic Mountains, the range that separates East and West [Antarctica](#). [\[Images: The Majestic Transantarctic Mountains\]](#)

"There are a lot of unique features about volcanoes that erupt under ice sheets, and we can determine how warm [the base of] that ice sheet was," Smellie said.

They discovered that neither side was right. East Antarctica wasn't exclusively warm or cold in the past 12 million years. Instead, the base of the ice sheet was a patchwork throughout its history. The findings were published in January 2014 in the journal *Geology*.

"[East Antarctica] is not liable to collapse if the world increases in temperature by 3 degrees Celsius," (or 5.4 degrees Fahrenheit), Smellie said.

Growing interest While glaciovolcanism is attracting growing interest from scientists, its experts say there is much work to be done in exploring and explaining volcano-ice interactions.

At Tolbachik, Edwards was studying a modern volcano to better interpret the strange shapes that formed when [Canada's volcanoes](#) erupted beneath glaciers.

Lava freezes into amazing patterns when it flows on, under and next to ice and snow, and modern eruptions offer clues to how these patterns form. "Most of my career is trying to do forensic studies, so it is very, very instructive to actually watch the lavas go into the ice and watch the textures form," Edwards said.

"I think we're on the cusp of a big burst of people starting to really take apart these old volcanoes," Edwards added. "There are a lot of places where no one has looked at these deposits."

Smellie hopes the burgeoning field will someday provide better constraints on climate models.

"One thing, which is kind of the holy grail for me, is that people have quite logically linked the waxing and waning of ice sheets to global sea levels, but no one has got any handle on the actual volumes of ice that are melting at any one time," he said. "My hope is that glaciovolcanism will give us much more rigorous and realistic thicknesses for ice in past times," Smellie said.

GSNH TEACHER GRANTS

The Geological Society of NH has several monetary grants available for classroom teachers. Don't let budget restraints crimp your classroom or professional development activities. Details at: <http://www.gsnhonline.org/outreach/outreach.shtml>

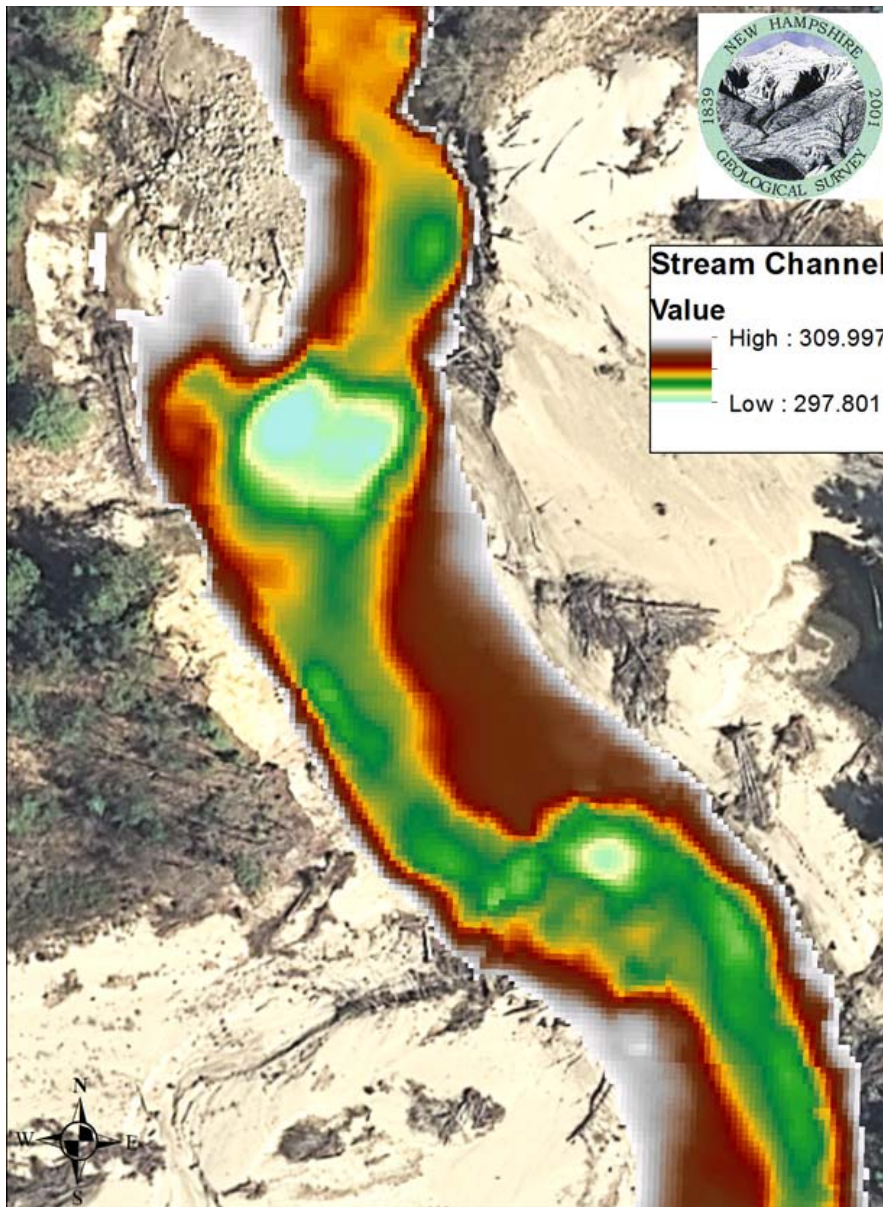
EXPERIMENTAL LIDAR UNDER DEVELOPMENT TO MAP RIVER BATHYMETRY

EAARL-B is an experimental LIDAR system designed to map bathymetry in waters up to 27 meters deep (1.5-2.5 x Secchi depth). The approach is described at <http://coastal.er.usgs.gov/lstrm/tech/eaarl/> as follows:

Experimental Advanced Airborne Research Lidar (EAARL) is an airborne lidar system that provides unique capabilities to survey coral reefs, nearshore benthic habitats, coastal vegetation, and sandy beaches. Operating in the blue-green portion of the electromagnetic spectrum, the EAARL is specifically designed to measure submerged topography and adjacent coastal land elevations seamlessly in a single scan of transmitted laser pulses.

Flights are conducted by USGS Coastal and Marine Geology Program—the plane is flown out of Maryland and data processing is performed in Florida. Theoretical depth is 27 meters, but effective depths in rivers are more likely to be limited to 16-20 feet because penetration of the laser waveform decreases as turbidity of the water column increases.

Vertical accuracies on the order of decimeters or less can be achieved under favorable conditions. Spacing of Lidar returns can be expected to support generation of a gridded elevation surface (digital elevation model or DEM) with a 1- to 2-meter resolution or cell size, adequate for mapping changes in aquatic habitat over significant distances. There are limitations in shallow environments (less than about 8 inches) because reflections from the water surface, water column, and bottom are so closely spaced in time that they are difficult to separate. Leaf off conditions are preferred when possible so that contemporaneous aerial photography can be used to help determine the water's edge. This technique was originally developed for coral reef and other coastal applications and the first river applications were conducted out West.



Channel bed topography as mapped by the EAARL-B green-light, airborne LiDAR system.

WHAT IS YOUR BOARD DOING? Submitted by Wayne Ives

Russ Wilder hosted the GSNH board meeting at the new URS offices in Manchester. The meeting was called to order and the first action was to skim the bylaws. The minutes from the previous meeting were approved with minor revisions. Wayne Ives passed around the newsletter draft for initial feedback. Abby Fopiano reported for the webmasters that we are shifting the GSNH website to a new server and layout. The price is expected to be lower and the noticeable changes should be slight and beneficial for navigation. The treasurer's report was deferred because Bill Abrahams-Dematte is in Poland. Julie Spencer described our current non-profit status. We then took steps to ensure continued non-profit status and also to maintain our business registration with the state. Doug Allen reported that membership is strong at over 200 with more coming in. Trent is to look at creating a LinkedIn application for GSNH members in addition to the existing FaceBook page. The growing membership led the Events Committee's discussion about our future dinner meeting venues in anticipation of larger attendance requiring more space and better audio visual setups. Erin Kirby confirmed that Denis LeBlanc from USGS will be the April speaker at Red Blazer. Lee Wilder noted that Bob Whitmore will be setting up a mineral display there. The October dinner meeting will be October 16 with a venue to be determined. Lee reported for the Education Committee that the Society hung its banner at the 2014 Mappers Workshop at DES and provided refreshments at a nominal cost. We discussed whether to repeat our support for teachers attending the NE GSA being held again at Bretton Woods. Lee has scanned in the old Geology of Mt. Washington report, hard copies of which were available at the January meeting, and it is now on the Society website. Lee has more surplus publications and suggested a silent auction as a means of distributing them fairly. We were reminded that the three-volume set of Hitchcock's Geology of New Hampshire is still sitting in a file drawer at USGS and perhaps we should find a more suitable and perhaps visible place for it. Wayne reported on the summer field trip plans with the Geological Society of Main and volunteered to get more information from them on what we can do to support the program. Lee reported that the Society now has the funds that we offered to manage for the Friends of the Madison Boulder. The Friends committee met in February and made a plan to meet again in April to develop renovation work plans including perhaps labor from GSNH volunteers. There was no other business and the meeting adjourned. Lee Wilder will host the next board meeting at Toad Hall in Tyler at 6pm, June 12th. Contact Lee if you intend to attend.

VOLCANO WORLD - <http://volcano.oregonstate.edu/oldroot/volcanoes/>

Take a look at the world's volcanoes through this website.



EARTHQUAKE FELT THROUGH CENTRAL N.H. By Jeremy Blackman,
Concord Monitor staff <http://www.concordmonitor.com/home/8873211-95/earthquake-felt-through-central-nh> - Friday, October 11, 2013

People from dozens of towns in central New Hampshire reported feeling what they described as an earthquake shortly after 9 p.m. The U.S. Geological Survey, which has limited operations during the partial federal government shutdown, did not provide immediate confirmation of the quake, but the New England Seismic Network, which operates out of Boston College, reported a magnitude 2.5 to 2.6 tremor, with its epicenter 5 kilometers northwest of Contoocook.

The Concord police said they fielded nearly half a dozen calls from residents in the area reporting structural shaking – though no immediate damage or injuries. Others posted on social media that they too had felt a noticeable rattling.

A 4.0-magnitude earthquake struck New England one year ago, centered in Maine and reverberating as far as Vermont and Connecticut. A 3.1-magnitude quake shook the area around the same time in 2010.



WMUR-TV (<http://bit.ly/GIFZIM>) reports that residents in more than a dozen communities from Franklin to Laconia reported feeling the ground shake or hearing a loud rumbling noise at 9:07 p.m. Source: <http://aki.bc.edu/index.htm>

CHANGE IN DINNER RESERVATION POLICY FOR APRIL 2014 DINNER MEETING from Erin Kirby

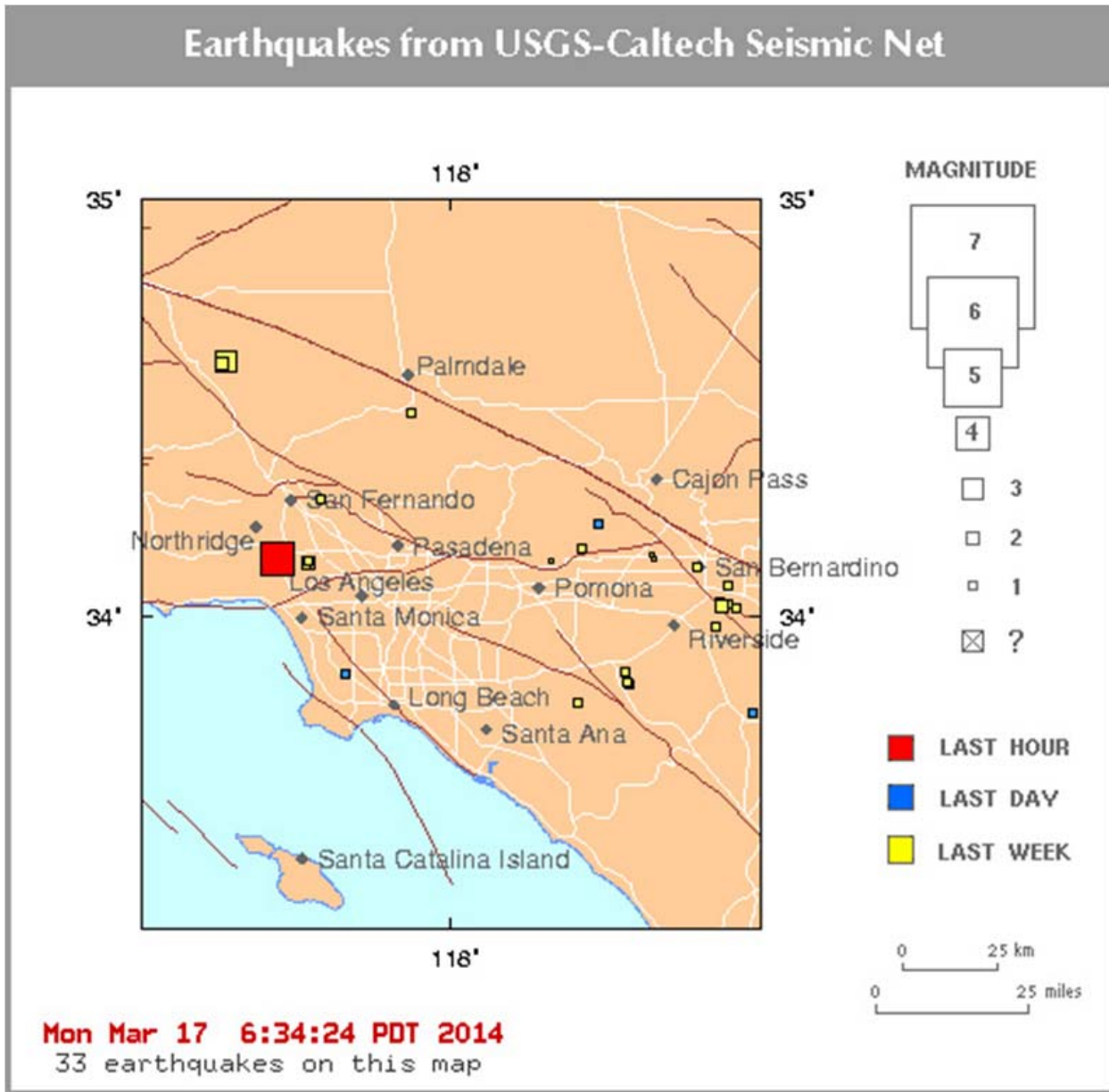
Due to limited seating capacity at the 17 April 2014 Dinner Meeting venue we are rolling out a new reservation policy: please send me an e-mail (ekirby@geosyntec.com) to reserve a place at the meeting by **Friday, April 2014** at noon. I will not be able to accept reservations that are mailed into the GSNH post office box; therefore, if you wish to mail your check for the dinner meeting, **please also e-mail me as that is how I will be accepting reservations.**

The Board is thrilled by the increased attendance rate and we want everyone who is interested to be able to attend. However, because the Red Blazer only has capacity to seat 88 people, any reservations received after 88 will have to be turned down. I apologize but we may not be able to honor walk-ins this time around. Reservations will be first come-first serve, so reserve early! I will respond to your e-mail and confirm your reservation. If you miss the cut off, I will also respond to your e-mail and let you know as well.

I am actively looking for new, larger venues so stay tuned for October!

MARCH 17, 2014 SEISMIC READINGS FROM EARTHQUAKE IN LA.

The pre-dawn earthquake rolled across the Los Angeles basin on Monday, rattling residents from the San Fernando Valley to Long Beach. The quake's magnitude was 4.4 and was centered 15 miles west-northwest of the downtown civic center, according to the U.S. Geological Survey. Los Angeles police and fire officials said there were no immediate reports of damage. Read more: <http://www.nydailynews.com/news/national/earthquake-rattles-los-angeles-early-monday-morning-article-1.1724046#ixzz2wKeX2QGM>



SOUTHERN CALIFORNIA EARTHQUAKE DATA CENTER

M4.4 - 9km NNW of Westwood, California 2014-03-17 13:25:36 UTC

<http://earthquake.usgs.gov/earthquakes/eventpage/ci15476961#summary>

NEWPORT SLOPE STABILITY INVESTIGATION by Rob Danckert (Cascade Drilling) and Jeffrey Lloyd, PE (Golder)

In 2013, Golder Associates Inc. conducted a supplemental subsurface investigation for a landslide that has plagued Vermont Route 191 in Newport since the early 1970s. The landslide was initiated by an embankment construction project associated with Route 191, and has been moving slowly since construction started in 1971. Initial remedial efforts included underdrain and lateral horizontal drainage array installation, and counter berm construction near the interpreted slide toe. Continual repairs include pavement shimming, guard rail maintenance, and culvert replacement.



Initially the landslide cause hypothesis consisted of continuous slope movements resulting from embankment fill loads and groundwater pressure effects on a circular slip surface extending from the uphill side of the roadway to the downslope toe of the counter berm. However, mitigation methods to address this hypothesis have been ineffective. Golder identified several data gaps during the first desk-top review phase, and the second phase was designed to fill the gaps and provide data for mitigation design.

The second phase of the project started in March 2013 and is ongoing. Tasks include: subsurface geologic/geotechnical drilling, using both sonic and conventional drill rigs; installation of automated and remotely read piezometers, inclinometers and ShapeAccelArrays; subsurface soil sample collection for detailed geotechnical testing (index, permeability, direct shear and continuous rate of strain); hydro-geologic test well installation; and hydrogeologic testing.

C

ascade Drilling, LP sonic drill rig and support vehicle with tracked carriers on site.

Twenty borings were drilled to fill the data gaps for the site. Additional tasks include monitoring to collect landslide movement and other data.

Cascade Drilling, LP of Northborough, Massachusetts was subcontracted to complete sonic drilling activities at the site using up to eight inch diameter temporarily-cased holes. The innovative use of sonic drilling to collect continuous, large diameter (4- inch) soil and bedrock samples for subsurface characterization and instrumentation installation allowed observation of key landslide features (such as folded varves-see photo attached) that may have been missed by other drilling methods. The sonic rig was used first to identify key sampling/ instrumentation depths, followed by conventional drilling to collect standard geotechnical samples (split spoons, vane shear and Shelby tubes) at the targeted depths. During sonic drilling, no tooling change-outs were required for differences in ground conditions – drilling through clay, sand, boulders, and bedrock all used the same sonic core barrel. This allowed for high production rates and continuous soil core through the full boring depth, including through ice-rafted boulders and weathered bedrock. Additionally, the large diameter temporary sonic casing allowed Cascade

Drilling, LP to sonically install 3.3 inch inclinometer casings to depths of up to 176 feet BGS within temporary six inch sonic casing (vs four inch “drive and wash” NW casing), and also installed 3.3 inch inclinometer casing with three vibrating wire piezometers mounted on the outside of the casing within in a single borehole.



Sample logging activities of sample cores obtained from a single borehole.

The automated instrumentation went online August 2013, using the Golder GIDIE platform, and now provides data on landslide movement and groundwater levels, allowing VTrans to monitor site conditions remotely and implement emergency procedures if needed. The hydrogeologic testing was designed to test the interconnectivity of the complex geologic system, and to estimate aquifer properties to assist in remedial design approaches. The remedial design will be the focus of the third phase, to be conducted after enough data has been collected to fill the data gaps.



Folded varves observed in several core samples corresponded with failure surface elevations observed in existing inclinometers.

GEOLOGICAL SOCIETY OF AMERICA
NORTHEASTERN SECTION - GOLDEN ANNIVERSARY
MARCH 23 - 25, 2015

★ INSPIRING GEOLOGY FOR 50 YEARS ★



NE GSA 2015 UPDATE

The Annual Meeting of the Northeastern Section of the Geological Society of America will be returning to the Bretton Woods' Omni-Mount Washington Resort in March, 2015. The Organizing Committee has been re-established and planning is actively underway.

Since 53% of this year's attendees were students, most looking for job and career-building contacts, and there's not likely to be much "new science" to report in just two years, the Committee has decided a substantial part of the meeting's program will uniquely emphasize applied and engineering geology, with programming set up in a more informal "forum format" that permits students and applied practitioners to interact more easily and frequently during the meeting. This "new" emphasis will provide an unusual opportunity for applied geoscientists from consulting, governmental, community planning, and industrial arenas to easily present case histories, innovative techniques, and methodological approaches, and to then interact informally ("talk shop") with an audience eager to learn about ways their geological &/or geotechnical training can help them develop career and employment prospects.

The Committee would like speak with applied professionals about ways they can become involved with this unique opportunity (e.g. presenters, forum conveners, internal event & meeting sponsors, etc.) to meet potential employees and have an active hand in encouraging students to pursue careers in applied geoscience - an effort we need to undertake to reverse the trend of geological students pursuing non-geological careers and employment. More information will be forthcoming, but if you're interested in being involved "on the ground floor" of this unique program (planning, etc.), please email Meeting Chair, Brian Fowler, at b2fmr@metrocast.net or contact Ryan Crosbie (info below). Ryan Crosbie, CEA, CHMM; Environmental & Land Manager; Pike Industries, Inc.; 3 Eastgate Park Road; Belmont, NH 03220; 603-527-5142
rcrosbie@pikeindustries.com

INVITATION TO THE NEW ENGLAND MINERAL CONFERENCE from Jeffrey Morrison, President, New England Mineral Association; 207.232.4973; jmorriss7@maine.rr.com

Welcome to the 2nd annual New England Mineral Conference. We had a great first year and everyone that came had a good time. First, we have moved the event up to the conference center at Sunday River ski resort in Newry, Maine. One of the primary reasons was the close proximity to the Maine Mineral and Gem Museum. The museum will host tours for conference participants. The museum will not be completed and not open to the public at this point, so you will get a "sneak peek of things to come" tour of the museum. We again have a great line-up of speakers and will again have some great displays. Last year's displays were amazing. It was great to see many world class specimens that had come from New England. We will be hosting a poster session for school age students. Students can submit a poster. Information and registration are at our web site at <http://www.nemineralconference.org>.

Cordially, Jeffrey Morrison, PO BOX 33, EAST POLAND, ME 04230-0033.

RARE DIAMOND REVEALS EARTH'S INTERIOR IS ALL WET

"It's actually the confirmation that there is a very, very large amount of water that's trapped in a really distinct layer in the deep Earth."

<http://www.livescience.com/44057-diamond-inclusions-mantle-water-earth.html>

GET READY FOR THE SUMMER FIELD TRIP WITH A VIRTUAL TOUR OF MAINE'S SURFICIAL GEOLOGY – MAINE GEOLOGICAL SURVEY

http://www.maine.gov/dacf/mgs/explore/surficial/virtual/virtual_surficial.pdf

OFFICE WORK GETTING BORING?

Office work getting boring? Subscribe to Earth Science Picture of the Day at: <http://epod.usra.edu/blog/subscribe-to-epod.html>. Topical pictures with an earth science bent are categorized by theme. Themes include geology, prehistoric life, glaciers, lightning, comets, hydrology and the pictures are described with abundant captions and meta links. An example is this photo of Edinburgh Castle on a basalt plug.



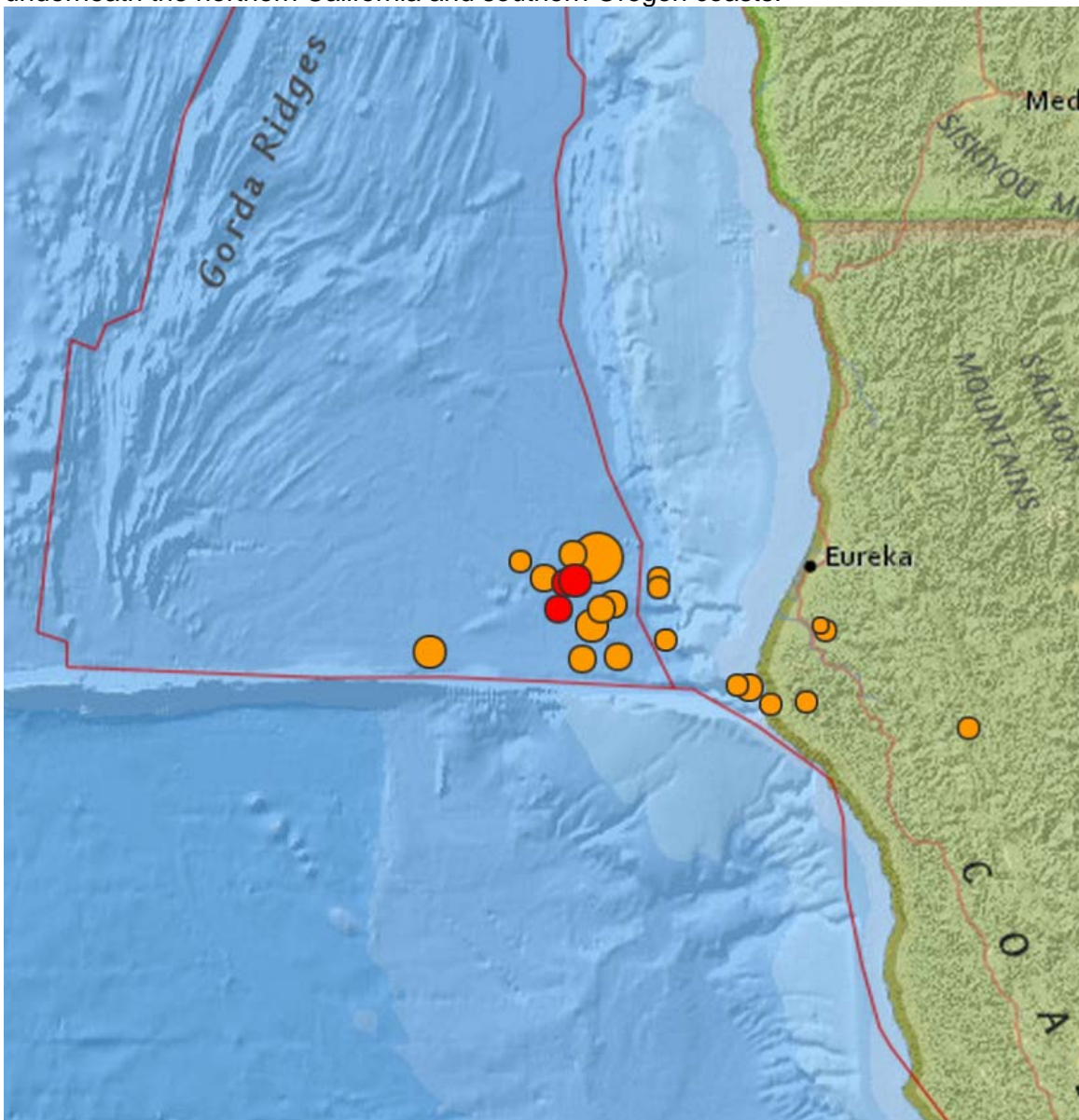
Typical epod caption: [Edinburgh Castle](#) sits atop an ancient [volcanic plug](#) composed of [basalt](#). This volcanic plug was a perfect vantage point for [royalty](#) wishing to oversee their realm. The city of [Edinburgh](#) is surrounded by seven such volcanic plugs -- all approximately 350 million years old. Archaeological excavations suggest that this site was inhabited as early as [850 BC](#). [Edinburgh Castle](#) was associated with monumental [Scottish battles](#) throughout the medieval period. Because its strategic geography permitted a 360-degree view for miles, it was nearly impossible for enemies to sneak up and attack the castle fortress. It makes sense that [commoners](#) wanted to live close by this stronghold. Thus, the city of Edinburgh rose around its famous castle. Photo taken on July 29, 2012.

Also see, at the end of the newsletter, a picture from this site of a recent eruption of Mount Sinabung, in Sumatra, Indonesia.

M6.9 CALIFORNIA EARTHQUAKE: LARGEST TREMOR FOR SEVEN YEARS STRIKES OFF CAPE MENDOCINO

Sources: <http://www.decodedscience.com/m6-9-california-earthquake-largest-tremor-seven-years-strikes-cape-mendocino/43540> and <http://www.latimes.com/local/lanow/la-me-ln-69-northern-california-earthquake-followed-by-aftershocks-20140310,0,4495673.story#axzz2vmkwATEj>

An earthquake of magnitude 6.9 (M6.9) which struck off the coast of north California on 10 March 2014 is the largest to hit the region since an M7.2 which occurred in the same area seven years ago. Sunday's temblor was followed by a series of at least 13 aftershocks as large as a magnitude 4.6, according to the U.S. Geological Survey. The big quake occurred at 10:18 p.m. in the Pacific Ocean 50 miles west of Eureka in Humboldt County. The USGS put the depth of the quake at about four miles. Several of the aftershocks were much closer to land, including one about 16 miles off the coast that registered as a magnitude 3.4. The temblor and at least 13 aftershocks were triggered by a rupture along a fault on the Gorda plate, which is slowly sliding underneath the northern California and southern Oregon coasts.



Location and tectonic setting of the earthquake of 10 March 2014. Image credit: USGS

DATES TO REMEMBER

April 24, 8pm – April 27, 12pm - Rochester Mineralogical Symposium including five talks by European speakers. Airport Raddison Inn, Rochester, NY (map)
<http://www.rasny.org/MinSymposium/MineralSymp.htm>

May 3-4, 2014 – 51st Annual New England Gem and Mineral Show, Topsfield Fairgrounds (Route 1 North), Topsfield, Massachusetts
<http://www.northshorerock.org/our-show/> (coupon on next page)

May 9-11, 2014 - 2nd Annual New England Mineral Conference - Grand Summit Resort Hotel & Conference Center, Sunday River, Newry, Maine
<http://www.nemineralconference.org/nema/Welcome.html>

May 21 - 23, 2014 - [Geological Association of Canada](#) - Joint Annual Meeting on the Fredericton campus of the University of New Brunswick
<http://www.unb.ca/conferences/gacmac2014/>

June 7 - 8, 2014 - [Northeastern Friends of the Pleistocene](#) - Quaternary Geology and Stratigraphy of New York's Finger Lakes Region, Auburn, NY
<http://www.geology.um.maine.edu/friends/>

June 28-29, 2014 - 50th Annual Gilsum Rock Swap <http://www.gilsum.org/rockswap>
Including Saturday at 1 PM: Bill Petronis, Hickory Hill Diamond Diggings, "History of the Herkimer and How to Find Them; Saturday at 2 PM: Steve Garza "Prospecting for beginners." Location: Gilsum Elementary School and Community Center, 640 Route 10 in Gilsum (just 10 minutes from Keene). This is an outdoor event, under canopies, held rain or shine.

July 19-20, 2014 – Geological Society of Maine field trip – Bethel Maine surficial and bedrock geology with Dyk Eusden and Woody Thompson. Saturday night BBQ – please sign up. See details elsewhere in this newsletter.

August, when? Capital Mineral Club Gem and Mineral Show – not posted yet, so keep an eye on their website at <http://www.capitalmineralclub.org/>.

August 18-22, 2014 - Geomorphic and Ecological Fundamentals for River and Stream Restoration - at the Sagehen Creek Field Station, Truckee, California. See <http://laep.ced.berkeley.edu/courses/riverrestoration>.

October 10-12, 2014 - Columbus Day Weekend, [New England Intercollegiate Geological Conference](#), Wellesley College, Wellesley MA
<http://w3.salemstate.edu/~lhanson/NEIGC/Conference.html>

March 23-25, 2015 - NE-GSA at Bretton Woods, NH – (See Ryan Crosbie's article on the new programming emphasis in this issue.)

51ST Annual 2014
NEW ENGLAND
Gem & Mineral Show
 Hosted by: North Shore Rock & Mineral Club

Saturday, May 3, 9:00 AM - 5:00 PM
Sunday, May 4, 10:00 AM - 4:00 PM
 Topsfield Fairgrounds, Coolidge Hall & Trade Building, Rt 1 North, Topsfield, Mass 01983

- Exhibits
- Hourly Door Prizes!
- Mineral and Fossil Identification.

RETAIL & WHOLESALE DEALERS
 Minerals, Fossils, Gem Stones, Jewelry, Beads, Lapidary & Jewelry Supplies.

CHILDREN ACTIVITIES INCLUDE:
 Spin-A-Gem, Gold Panning, Mineral Sifting, Geode Cracking

DIRECTIONS:
From South: I-95 N, Exit 50 to Rt 1 N. Go 2 miles, Fairgrounds on right
From North: I-95 S, Exit 53 to Rt 97, Go to Rt 1 thru Topsfield, Take a right at the lights at Rt 1. Go 1/4 mile, Fairgrounds on left

General Admission \$5.00 per person
\$4.00 with ad (limit 2 per ad)
Seniors \$3.00. Children under 12 Free
FREE PARKING

Visit our website: www.northshorerock.org
 or e-mail: nsmc@verizon.net
 for more discount flyers



GSNH LEGISLATIVE TRACKING UPDATE –March 11, 2014 submitted by Russ Wilder

[HB 1157](#) relative to establishment of fees by certain regulatory boards. This bill provides that certain occupational and regulatory boards shall determine fees sufficient to produce estimated revenues equal to 125 percent of the direct operating expenses of the board budgeted for the biennium in which they will apply. **Status:** Public Hearing: 1/16/2014 11:30 AM LOB 306

[HB 1186](#) relative to rulemaking authority of certain occupational boards concerning examinations. This bill removes requirements that rules of certain occupational boards under the joint board establish the time and place for examinations of applicants. This bill is a request of the joint board for licensure and certification. **Status:** Introduced 1/8/2014 and Referred to Executive Departments and Administration

[HB 1569 –FN](#) permitting licensing requirements to be waived for buyers and sellers. This bill permits buyers and sellers to waive state licensing requirements. **Status:** Public Hearing: 1/28/2014 1:30 PM LOB 306. Inexpedient to Legislate.

[2014-S-2686-R](#) Establishing a committee to study the current status of land conservation in New Hampshire and the state's role in encouraging the voluntary protection of land in the future.

[HB 1100](#) Establishing a committee to study the ownership by public entities of land for conservation purposes. Prime sponsor: Franklin Bishop. Introduced 1/8/2014 and Referred to Resources, Recreation and Development. Executive Session: 3/04/2014 10:15 AM LOB 305

[HB 1258](#) Relative to fill and dredge permitting applications. Prime sponsor: Shannon Chandley. Introduced 1/8/2014 and Referred to Resources, Recreation and Development. Committee Report: Ought to Pass with Amendment #2014-0704h (Vote 15-0; CC)

[HB 1271](#) Establishing a committee to study the powers and duties of conservation commissions. Prime sponsor: Shawn Jasper. Introduced 1/8/2014 and Referred to Resources, Recreation and Development. Executive Session: 3/04/2014 10:15 AM LOB 305

[HB 1383](#) Relative to municipal monitoring of large groundwater withdrawals. Prime sponsor: Karen Umberger. Introduced 1/8/2014 and Referred to Resources, Recreation and Development. Committee Report: Ought to Pass with Amendment #2014-0358h for TBD (Vote 14-0; CC)

[HB 1467](#) Relative to large groundwater withdrawal permits. Prime sponsor: Maureen Mann. Introduced 1/8/2014 and Referred to Resources, Recreation and Development. Committee Report: Inexpedient to Legislate for TBD (Vote 13-0; CC)

HB 1151 Establishing a committee to study the solid waste operator training program and financial assurance for corrective action at solid waste landfills. Prime sponsor: Tara Sad. Introduced 1/8/2014 and Referred to Environment and Agriculture. Committee Report: Ought to Pass (Vote 17-0; CC)

HB 1220 Relative to limitations on ethanol in gasoline. Prime sponsor: David Campbell. Introduced 1/8/2014 and Referred to Science, Technology and Energy. Committee Report: Ought to Pass with Amendment #2014-0697h (Vote 15-0; CC)

HB 1229 Relative to the oil discharge and gasoline ether cleanup fund. Prime sponsor: Leigh Webb. Introduced 1/8/2014 and Referred to Resources, Recreation and Development. Referred to Ways and Means. ==RESCHEDULED== Work Session: 3/6/2014 10:00 AM LOB 202. Executive Session: 3/18/2014 10:00 AM LOB 202

HB 1532 Relative to notification of radon level prior to sale or lease of property. Prime sponsor Susan Almy. Introduced 1/8/2014 and Referred to Commerce and Consumer Affairs. Subcommittee Work Session: 3/4/2014 9:30 AM LOB 302. Executive Session: 3/04/2014 1:15 PM LOB 302

HB 1254 Establishing a committee to study and propose a recodification of certain environment-related statutes. Prime sponsor: Daniel Itse. Introduced 1/8/2014 and Referred to Resources, Recreation and Development. Inexpedient to Legislate: MA VV

HB 1305 Relative to the definition of asbestos abatement. Prime sponsor: Dan McGuire. Introduced 1/8/2014 and Referred to Environment and Agriculture. Inexpedient to Legislate: MA

HB 1573 Discontinuing regional planning commissions and requiring the election of municipal planning board members. Prime sponsor: Jane Cormier. Introduced 1/8/2014 and Referred to Municipal and County Government. Inexpedient to Legislate: MA

SB 252 Relative to the management of hazardous waste. Prime sponsor: Bette Lasky. Introduced 1/8/2014 and Referred to Energy and Natural Resources. Sen. Bradley Moved Laid on Table, MA, VV; SJ 5

SB 325 Relative to oil spill preparedness and response. Prime sponsor: Jeff Woodburn. Introduced 1/8/2014 and Referred to Energy and Natural Resources. Committee Report: Ought to Pass with Amendment #2014-0922s, 3/13/14; SC9

SB 334 Relative to certification and licensure for mold assessment or remediation services. Prime sponsor: Peggy Gilmour. Introduced 1/8/2014 and Referred to Executive Departments and Administration. Committee Report: Referred to Interim Study, 3/13/14; Vote 5-0; CC; SC9

SB 267 Extending the effective date for integrated land development permits. Prime sponsor: Bob Odell. Introduced 1/8/2014 and Referred to Energy and Natural Resources. Hearing: 3/12/14, Room 101, LOB, 9:00 a.m.; SC9

SB 347 Relative to municipal enforcement of land use ordinances. Prime sponsor: David Waters. Introduced 1/8/2014 and Referred to Public and Municipal Affairs. Ought to Pass with Amendment 0693s, MA, VV; OT3rdg; SJ 6

SB 388 Establishing a committee to study the current status of land conservation in New Hampshire and the state's role in encouraging the voluntary protection of land in the future. Prime sponsor: Martha Fuller Clark. Introduced and Referred to Energy and Natural Resources. Hearing: 3/12/14, Room 101, LOB, 9:15 a.m.; SC9

LEGISLATIVE COMMITTEE REJECTS MAINE MINING RULES

http://www.pressherald.com/news/Legislative_committee_rejects_Maine_mining_rules_.html
Maine DEP info page: <http://www.maine.gov/dep/land/mining/metallic-mineral.html>

MAINE CG BOARD ELIMINATION PROPOSAL REJECTED

From Keith Taylor – January 30, 2014 - Patrick Flood, my State representative and a member of the Appropriations Committee, told me today that the Committee voted last week unanimously to reject the proposal to eliminate the CG Board. Pat made the motion. Thanks to those who contacted their representatives and/or testified.

THE NH GEOLOGICAL SURVEY GROUND WATER LEVEL NETWORK SUMMARY

Submitted by the NHGS

December 2013

NH Groundwater level measurements were collected by the NH Geological Survey from December 20 – December 31, 2013. The statewide December 2013 average groundwater level for **wells in the overburden** (soil on top of the bedrock) showed an increase of +0.08 feet from November 2013. When compared with December 2012, the statewide average groundwater level for December 2013, in these wells, decreased -0.69 feet. The December 2013 average groundwater level in the new **bedrock wells** showed an increase of +0.34 feet when compared with November 2013. When compared with December 2012, the bedrock wells showed a decrease of -1.30 feet for December 2013.

January 2014

NH Groundwater level measurements were collected by the NH Geological Survey from January 27 – January 31, 2014. The statewide January 2014 average groundwater level for **wells in the overburden** (soil on top of the bedrock) showed an increase of +0.58 feet from December 2013. When compared with January 2013, the statewide average groundwater level for January 2014, in these wells, increased +0.19 feet. The January 2014 average groundwater level in the new **bedrock wells** showed an increase of +1.66 feet when compared with December 2013. When compared with January 2013, the bedrock wells showed an increase of +0.39 feet for January 2014.

February 2014

NH Groundwater level measurements were collected by the NH Geological Survey from February 24 – March 02, 2014. The statewide February 2014 average groundwater level for **wells in the overburden** (soil on top of the bedrock) showed a decrease of -0.31 feet from January 2014. When compared with February 2013, the statewide average groundwater level for February 2014, in these wells, decreased -0.03 feet. The February 2014 average groundwater level in the new **bedrock wells** showed a decrease of -0.02 feet when compared with January 2014. When compared with February 2013, the bedrock wells showed an increase of +0.28 feet for February 2014.

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>.

EARTH SCIENCE WEEK 2013 - A WORLDWIDE SUCCESS

While figures are still being tallied, an estimated more than 50 million people gained a new awareness of the geosciences through the 16th annual Earth Science Week (<http://www.earthsciweek.org>) last October. The event celebrated the theme “Mapping Our World” by illuminating the many exciting ways geoscientists use maps to study the planet.

Events ranged from students conducting classroom science projects to activities at science centers and museums. National Fossil Day, October 16, reached millions with paleontology activities and resources. Women in the Geosciences Day, October 17, enabled professional geoscientists to share the excitement of their careers with young women. And the second annual Geologic Map Day engaged students in learning about the vital uses of geologic maps (<http://www.earthsciweek.org/geologicmap/index.html>).



Paul Rydel, Hydrogeologist at the NH Department of Environmental Services receives a hug from President Julie Spencer for his January 16 presentation to the Society “Arsenic and Manganese – Anthropogenic Source or Background Condition?”

2014 NE FRIENDS OF THE PLEISTOCENE

Hosts: Andrew Kozlowski, Brian Bird – New York State Museum/Geological Survey

When: June 7 and 8, 2014 Where: Auburn, New York

For the past four years the NYSGS geologic mapping program and Quaternary Research group have been actively working on numerous field projects associated with Cayuga County in the East/Central Finger Lakes Region. Cayuga County is a long north-south oriented county that spans from the southern end of the Finger Lakes to the Ontario Basin. Join us as we traverse a fascinating landscape from southern Cayuga County northward into the world famous Ontario Drumlin Field. Stops will focus on proglacial lake levels, meltwater routing, new mapping and identification from LIDAR imagery of glacial landforms, sediment-landform relationships, glacial dynamics, process models and glacial land systems, new chronologic data and regional correlations, subglacial landforms, ice margins, glacial stratigraphy and sedimentology, mega-fauna and flora. Please join us, and contact me if you have any questions about the trip. Further information on registration, trip details and logistics will be posted soon on the NYSGS and NEFOP websites. <http://www.geology.um.maine.edu/friends/>

Please click on this link and fill out the short survey that will help us to estimate the 2014 NE FOP Attendance - <http://snipurl.com/2014nefop>

SUMMER FIELD TRIP UPDATE – Wayne Ives

The link up with **Geological Society of Maine** for a **July 19-20, 2014** for glacial and bedrock stops run by Woody Thompson and Dyk Eusden is ON. This year's summer field trip will be an overnight field trip to the **Bethel-Sunday River** area. Keith Taylor, the GSM president sent these plans for the field trip.

Saturday, July 19: Woody and others will be leading a bedrock and glacial combo, hopefully along with U. Maine and DOT geologists commenting on Route 2 highway geology, landslide occurrences and concerns, and new exposure dating of the Androscoggin Moraine complex.

Sunday, July 20: Dyk will be taking us up to the top of the Sunday River ski area by chairlift to see spectacular bedrock exposures he has been mapping. Note that this trip may extend further into Sunday afternoon than at past GSM field trips.

Other Stuff: Arrive at campground Friday night. A camp site has not been selected yet, but we will be providing more information in the future. There also is a wide selection of inns and hotels in Bethel. Saturday breakfast and lunch and Sunday breakfast and lunch on your own. Saturday night GSM is planning to hire a mobile BBQ caterer to serve at the campground.

I WILL NEED A HEAD COUNT IF YOU WANT THE BBQ. Field trip transportation on your own (carpool.), Field trips usually from 9AM to 4PM Saturday, 9AM to about 2PM Sunday although the Sunday River mountain top visit will make it stretch longer than usual into Sunday.

Feel free to direct questions or comments to me at Wayne.Ives@des.nh.gov and I will forward them to Keith and be able to update the membership through the GSNH site. You might also keep an eye on the GSM site at <http://www.gsmmaine.org/>.

AVAILABLE NOW – THE DIRECTORY OF GEOSCIENCE DEPARTMENTS 49TH EDITION

Updated for 2014, The Directory of Geoscience Departments is the only comprehensive guide to geoscience organizations around the world and it is a vital resource for thousands of scientists, policymakers, publishers, students, and the general public to find various geoscience programs and connect with colleagues. The 49th Edition provides a state/country-sorted listing of nearly 2,300 university departments, museums, federal agencies, geological surveys, and research institutes. Contact information is provided as well as details on enrollments, faculty specialties and the date and source of faculty and staff's highest degree. The 49th Edition also includes a listing of all the U.S. and Canadian geoscience theses and dissertations accepted in 2011 that have been reported to GeoRef Information Services.

The new hardcopy edition is \$35 (\$28 for AGI member society members) and is now available direct from AGI (<http://bit.ly/1fbhBsN>) or Amazon.com (<http://amzn.to/1fbhCNz>). ISBN: 978-0-922152-96-4. Contact: Carolyn Wilson (cwilson@agiweb.org)

THE HUNT FOR METEORITES BEGINS IN ANTARCTICA by Rae Ellen Bichell

NPR – December 28, 2013

With statements like “The meteorite hunters are a hardy crew. Sleeping on a creaky slab of ice hundreds of feet thick can be a bit unnerving” this might be a news story you’d like.

<http://www.npr.org/2013/12/20/255745828/the-hunt-for-meteorites-begins-in-antarctica?ft=3&f=1002>



PEOPLE REPORT FIREBALL OVER IOWA SKY Submitted by [Brenda McGregor](#)

12/29/2013 <http://frenchtribune.com/teneur/1321311-people-reported-fireball-over-iowa-sky>

Hundreds of people have reported a bright colorful fireball in Iowa at around 5:40 p. m. on Thursday night [Dec.26]. Many of the eyewitnesses said that they have seen a spectacular green ball as bright as the sun shoot across the sky. The American Meteor Society (AMS) declared this cosmic event to be the fifth most reported fireball in the history of online AMS reporting system.

AN ANCIENT EXTINCT FLOWER FOUND IN AMBER

After analysing a 100-million-year old fossil mined in the Hukawng Valley of Myanmar, Oregon State University specialists were shocked at how well protected the group of 18 small flowers was inside one piece of amber. A 100-million-year old piece of amber has been discovered which reveals the oldest evidence of sexual reproduction in a flowering plant. “In Cretaceous flowers we’ve never before seen a fossil that shows the pollen tube actually entering the stigma,” said George Poinar, Jr., a professor emeritus in the Department of Integrative Biology at the OSU College of Science. “This is the beauty of amber fossils. They are preserved so rapidly after entering the resin that structures such as pollen grains and tubes can be detected with a microscope.”



<http://oregonstate.edu/ua/ncs/archives/2014/jan/amber-fossil-reveals-ancient-reproduction-flowering-plants>

BELKNAP RANGE LAND CONSERVATION CAMPAIGN UPDATE - by Russell J. Wilder

Conserving 950 Acres in the Belknap Range - The Lakes Region Conservation Trust and the Society for the Protection of New Hampshire Forests (Forest Society), along with the Belknap Range Conservation Coalition and its members, including the towns of Alton and Gilford, are working together to conserve four important parcels — totaling approximately 950 acres — on Mt. Major and elsewhere in the Belknap Range. These parcels encompass parts of key hiking trails, including the most popular trails to the summit of Mt. Major, unfragmented forests and rare plant communities, unique geology and valuable wildlife habitat. They also contribute to the protection of the water quality of Lake Winnepesaukee and other nearby lakes and rivers.

More than 1,250 individual donors, foundations and other grant-making organizations, and the towns of Gilford and Alton have already provided generous support for the Mt. Major/Belknaps project. Approximately \$1.6 million has been raised to date, toward the campaign goal of \$1.8 million. To donate, go to:

<https://donatenow.networkforgood.org/lrct?code=capital%20campaigns>.

MOUNT SINABUNG ERUPTION OF JANUARY 2014



Another Earth Science Picture of the Day at <http://epod.usra.edu/blog/2014/02/mount-sinabung-eruption-of-january-2014.html>. The photo above shows a [pyroclastic flow](#) (foreground) with [volcanic lightning](#) during the recent [eruption](#) of [Mount Sinabung](#), a [stratovolcano](#) on [Sumatra](#), [Indonesia](#).



Geological Society of New Hampshire

GSNH Dinner Meeting

Groundwater contributing areas to wells and surface waters on Cape Cod -- Modeling analysis and a field study near a glacial kettle lake

Speaker: Denis LeBlanc, Hydrologist
US Geological Survey
Northborough, MA

Thursday, April 17, 2014

Red Blazer Restaurant
72 Manchester Street, Concord, NH

5:30 pm Social Hour; 6:30 pm Buffet Dinner; 7:15 pm Speaker

New time - RSVP by noon Friday, April 11, 2014 to get the reservation price; Maximum capacity is 88—Reserve with Erin Kirby by email even if mailing a check. Make checks payable to GSNH.

Mail checks to: GSNH 2014 Annual Spring Dinner Meeting, P.O. Box 3483, Concord, NH 03302-3483 Please indicate the number of vegetarian meals.

Advance Reservations:	Member (Dues Paid)	\$22.00
	Non-member	\$25.00
	Students with valid student ID card	\$10.00
Late or No Reservations:	Member at the Door	\$25.00
	Non-Member at the Door	\$28.00

GSNH will accept dinner reservations by e-mail, which will then allow you to pay at the door. Please note that e-mail reservations constitute an agreement with the Society for which you will be responsible to pay, whether you are able to attend or not, unless you cancel your reservation by by the advance reservation deadline.

Advance Reservation Deadline is Friday at noon of the week before the dinner.

Reply via e-mail to: EKirby@Geosyntec.com.

Half the cost of the dinner may be tax-deductible as a business expense. **The lecture part of the program counts as 1.5 hours of CEU contact hour credit.**



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

Office Telephone

Home Fax:

Office Fax:

E-mail:

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:

<u>Year</u>	<u>Degree</u>	<u>Major</u>	<u>College or University</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

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

- Membership Committee
- Regulations Committee
- Communications Committee
- Legislative Committee
- Education Committee
- (Newsletter or Website, circle preference)
- 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. Please return this completed application form with any necessary corrections and a check for the appropriate dues to the GSNH at the address above.

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

Signature: _____ Date: _____