



Granite State Geologist

The Newsletter of the Geological Society of New Hampshire,
Winter Edition – December 2014 – Issue No. 87

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- Kilauea volcano
- Solar Flares
- Get your NY State PG license
- Legislative updates
- NE GSA registration links and costs
- What your Board is doing
- Upcoming Events and Much More!

MESSAGE FROM THE PRESIDENT

Wayne Ives, GSNH President, 2014-2016

These are exciting times to be a geologist : a rocket has landed on an asteroid, lava is flowing on Hawaii, earth's gravity is shifting, giant solar flares are erupting, and the upcoming Northeastern Section 50th anniversary GSA meeting will be held in New Hampshire. What's next?

The new Board of Directors met at USGS a few weeks ago and meeting notes are in this newsletter. At our January dinner meeting, our former NH State Geologist, David Wunsch, will be giving the dinner meeting address. This spring marks the first time in years that the Society will hold its meeting outside of Concord—The April 16 meeting will be held at the Puritan in Manchester. Be sure to sign up in a timely manner. Also, rocks may crumble, but there are some things that are eternal—your dues are up again December 31!!! There's a new membership form that is designed to be easier for renewals. Get your dues caught up now! Be sure to send mail to the Society's new mailing address—see the forms in the back of this newsletter.

Now for some plugs : I'd like to open up our dinner meetings to poster sessions for anyone— particularly for students. Is there anyone interested? Let the us know and we'll set you up. I encourage each of us to try to attend the GSA meeting this spring—early registration prices end February 17, so start planning now. Also, now's the time to get your NY geology license under their new program. Finally, I want to thank the past and present Board members for their efforts and for their labors still to come. And make a pitch for members to join us. I had a lot of fun starting with committee work, then as a member-at-large, and vice president. Now I'm looking forward to seeing what new areas the Society can explore. The new board is now in full swing and planning the spring meeting and summer field trip, tracking legislation, providing information to members and the public, and looking at

what more we can do. I encourage interested members to attend the next meeting March 12, 6pm at NHDES in Concord.

VOLCANO ERUPTIONS HAVE DEEP ORIGINS

By **Simon Redfern** Reporter, BBC News 29 April 2014 - Sometimes the volcano erupts gently, with dribbles of lava running down the mountain's flanks, while other times she throws fountains of lava high into the sky, or produces curtains of fiery rock in a spectacular show. Just this week the Hawaiian Volcano Observatory reported on a river of lava that is slowly flowing from Kilauea volcano's east rift zone towards the community of Puna. Up to now, the assumption has been that the differences in volcanic eruption style can be attributed to differences in how quickly the molten rock reaches the surface, or whether the gas it contains can escape gently ahead of the magma on its ascent. But new evidence suggests that what controls these eruptions sits deeper still.

By measuring the chemistry of the original molten rock associated with each eruption, now preserved as glassy blobs in the volcanic mineral grains, the scientists found that energetic eruptions and gentler "effusive" eruptions seem to have come from areas of the mantle with subtly different chemistries. Describing their results, lead investigator Dr. Marie Edmonds of Cambridge University told BBC News: "The chemistry of the primitive melts feeding the explosive eruptions appears statistically different to those feeding effusive eruptions. "We think that these primitive melts may saturate with gases and grow their bubbles deep in the system, accelerate towards the surface to a greater degree and bypass the summit magma chamber, erupting more explosively at the surface.

"This work is the first to show a link between the nature of the melts produced in Earth's mantle, and variations in surface eruption styles. It has important implications for volcano monitoring and hazard assessment." The data suggest that the changes in eruption reflect subtle local variations in the chemistry of Earth's mantle occurring over decades to centuries. The team believe that a better understanding of these variations will improve volcanic hazard assessment and perhaps land use planning and risk management over similar timescales.

<http://www.bbc.com/news/science-environment-27204647>

29 April 2014 Just this week the Hawaiian Volcano Observatory reported on a river of lava that is slowly flowing from Kilauea volcano's east rift zone towards the community of Puna.

27 June, 2014 Kilauea has been continuously erupting since 1983, but lava began flowing from a new vent, moving 800ft a day.

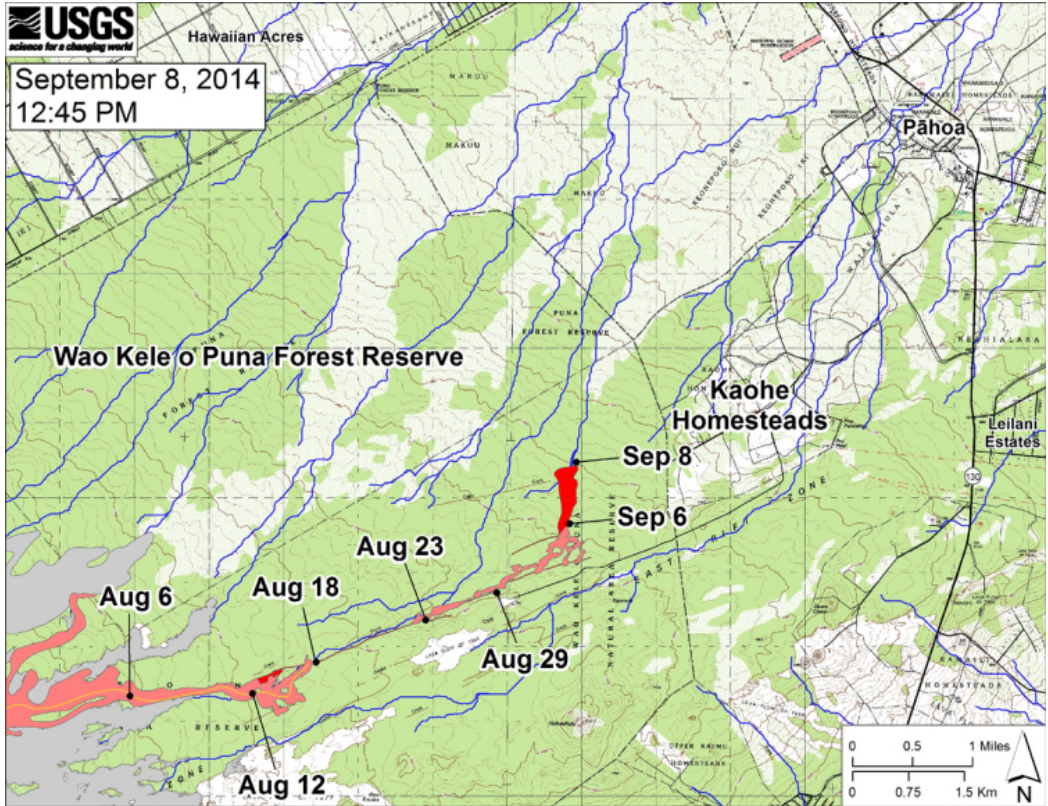
5 September 2014 Hawaii's Big Island has declared a state of emergency as a lava flow from Kilauea volcano is less than a mile (1.6km) from a residential community. The Hawaiian Volcano Observatory said the lava could reach the Kaohe Homesteads in about five to seven days. Lava flows from the volcano previously wiped out neighborhoods in 1990.

1 December, 2014 The lava is moving through forested land and has advanced about 400 yards since Sunday. The county says the lava doesn't immediately pose a threat to area communities.

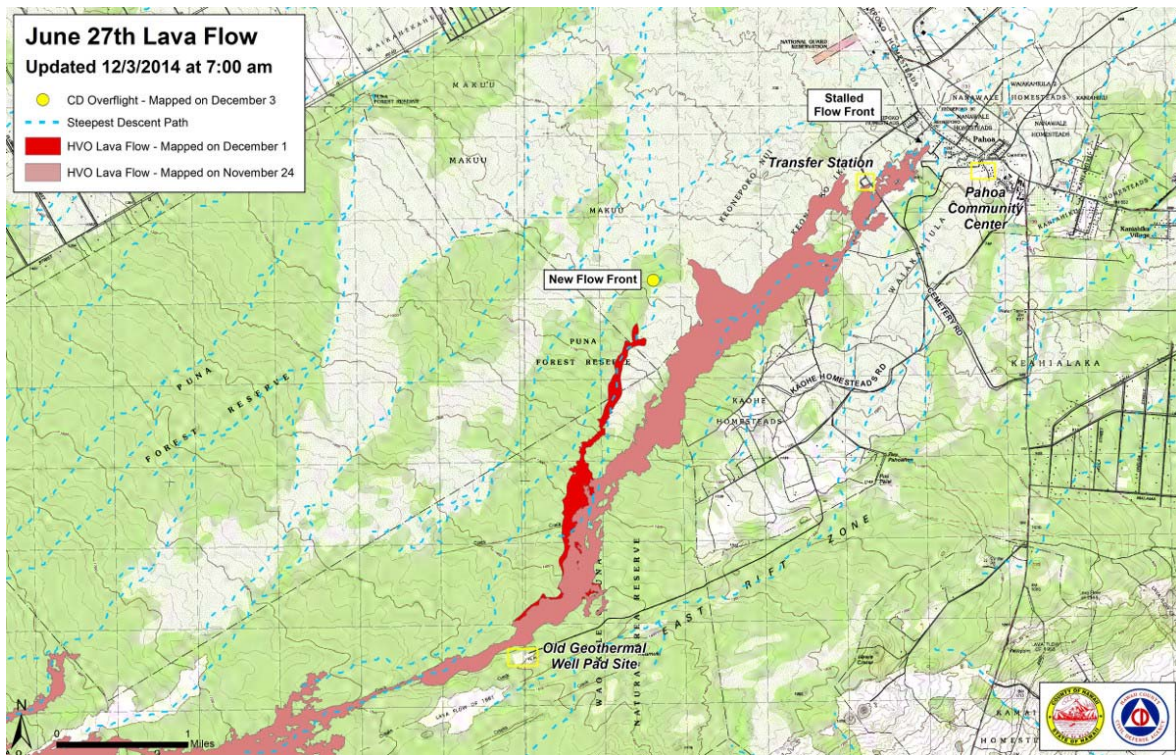


December 1, 2014 - A small breakout was also active on the upslope portion of the June 27th lava flow. The pahoehoe lava was flowing over an a'a flow from late 2007. USGS

<http://www.hawaiinewsnow.com/story/27520268/hawaii-lava-flow-shifts-but-still-near-pahoa-town>
<http://www.bigislandvideonews.com/2014/09/08/kaoh-pahoa-notice-evening-lava-flow-update-sept-9/>



Lava flow extent as of September 8, 2014



Lava flow extent as of December 3, 2014

DEPARTMENT OF LAND AND NATURAL RESOURCES ARRESTS TWO FOR ILLEGAL LAVA TOURS DECEMBER 2, 2104



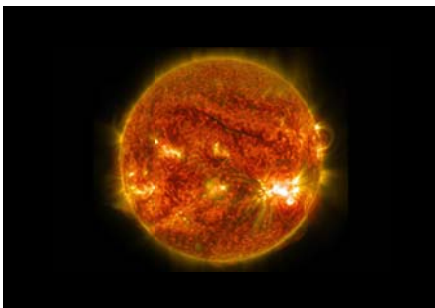
Orion Enocencio, manager of 'Ahiu Hawaii tours, poses next to molten lava in an "Aloha Friday" promotion on the company's **Facebook page**. Enocencio was *not* one of the two tour guides arrested by DLNR officers on Monday.

<http://www.bigislandvideonews.com/2014/12/02/dlnr-arrests-two-illegal-lava-tours/>

GIANT SUNSPOT KEEPS FIRING OFF HUGE SOLAR FLARES By Miriam Kramer, Staff Writer - October 27, 2014 <http://www.space.com/27552-giant-sunspot-huge-solar-flares.html>

The largest sunspot observed on the sun in more than 20 years has been firing off powerful solar flares for the past week, and it's still producing strong solar storms. Today, the huge sunspot erupted with a [large solar flare](#), peaking at around 10:47 a.m. EDT (1447 GMT). The flare caused a strong radio blackout on Earth, according to the National Weather Service's Space Weather Prediction Center. This solar flare is the fourth X-flare (the most powerful kind of solar storms) in as many days. If aimed at Earth, X-class flares can be dangerous for astronauts and spacecraft orbiting the planet. The radiation can disrupt radio and communication signals, but solar flares cannot injure people on Earth's surface, according to Fox. The planet's atmosphere acts as a protective barrier from the harmful radiation. Although Friday's X3.1 flare is a powerful solar storm, it isn't the most powerful flare of the year. In February 2014, the sun discharged an X4.9-class tempest.

[Solar flares: Is the sun trying to tell us something?](#)



The largest sunspot seen in two decades has been firing off major solar flares for the past week. What's going on with our sun?

View on www.csmonitor.com

ANTARCTICA HAS LOST SO MUCH LAND ICE THAT EARTH'S GRAVITY HAS SHIFTED (A TINY BIT) by David Brooks Wednesday, October 1, 2014

<http://www.nashuatelegraph.com/granitegeek/1047666-468/antarctica-has-lost-so-much-land-ice.html>

Climate change does weird things at the poles, where its effect is strongest. For reasons that baffle even folks who understand this stuff, Antarctica sea ice is [at a record high](#) while the amount of Antarctica land ice has fallen so far that [it has produced a measurable \(although teeny-tiny\) effect on Earth's gravity](#), according to measurements by satellites of the European Space Agency.

Why is Arctic ice shrinking fast yet Antarctic sea ice (but not, apparently, its land ice) growing? Hard to say: *It's easy to understand why the Arctic has been experiencing extreme melts, given that the region is the fastest warming area on the planet. It's not as obvious why the ice might be growing in Antarctica; although wind and precipitation patterns have both been suggested, no consensus has emerged.*

As far as rising ocean levels go, melting land ice - from Antarctica or Greenland, the two great ice storehouses is very bad while melting sea ice is of little importance, for obvious reasons.

See the source at :

http://www.slate.com/blogs/future_tense/2014/09/29/antarctic_ice_melt_causes_small_shift_in_gravity.html "The loss of ice from West Antarctica between 2009 and 2012 caused a dip in the gravity field over the region," writes the European Space Agency, whose satellite measured the change. Apparently, melting billions of tons of ice year after year has implications that would make even Isaac Newton blanch.

THE GSNH DINNER MEETING

MAKE YOUR RESERVATION NOW!

JANUARY 15, 2014

AT MAKRIS LOBSTER HOUSE

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

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

Mail to: **Erin Kirby, GSNH Dinner Meeting, PO Box 401, Concord, NH 03302.**

Checks payable to: GSNH.

A GLOBAL SURGE OF GREAT EARTHQUAKES FROM 2004-2014 AND IMPLICATIONS FOR CASCADIA <http://www.geosociety.org/news/pr/2014/14-76.htm>

The last ten years have been a remarkable time for great earthquakes. Since December 2004 there have been no less than 18 quakes of Mw8.0 or greater – a rate of more than twice that seen from 1900 to mid-2004. Hundreds of thousands of lives have been lost and massive damage has resulted from these great earthquakes. But as devastating as such events can be, these recent great quakes have come with a silver lining: They coincide with unprecedented advances in technological and scientific capacity for learning from them.

"We previously had very limited information about how ruptures grow into great earthquakes and interact with regions around them," said seismologist Thorne Lay of the University of California at Santa Cruz. "So we are using the recorded data for these recent events to guide our understanding of future earthquakes. We've gained a new level of appreciation for how one earthquake can influence events in other zones."

High on the list of areas ripe for a great quake is Cascadia, the Pacific Northwest, where the risk for great quakes had long been under appreciated. Evidence began surfacing about 20 years ago that there had been a great quake in the region in the year 1700. Since then the view of the great quake risk in Cascadia has shifted dramatically.

“We don't know many details about what happened in 1700,” said Lay. There were no instruments back then to observe and record it. And so the best way to try and understand the danger and what could happen in Cascadia is to study the recent events elsewhere.

Over the last decade Lay and his colleagues have been able to gather fine details about these giant earthquakes using data from an expanded global networks of seismometers, GPS stations, tsunami gauges, and new satellite imaging capabilities such as GRACE, InSAR, and LandSAT interferometry. Among the broader conclusions they have come to is that great quakes are very complicated and idiosyncratic. “What we've seen is that we can have multiple faults activated,” said Lay. “We've seen it off Sumatra and off Japan. Once earthquakes get going they can activate faulting in areas that were thought not physically feasible.”

The great Sumatra-Andaman earthquake of Dec. 26, 2004, for instance, unzipped a 1,300 kilometer long segment of the subduction zone and unleashed one of history's most destructive, deadly tsunamis. Much of the rupture was along a region with very limited plate convergence. In Japan, the Kuril Islands, and the Solomon Islands, great mega-thrust ruptures have ruptured portions of the subduction zones that were thought too warm or weak to experience earthquakes.

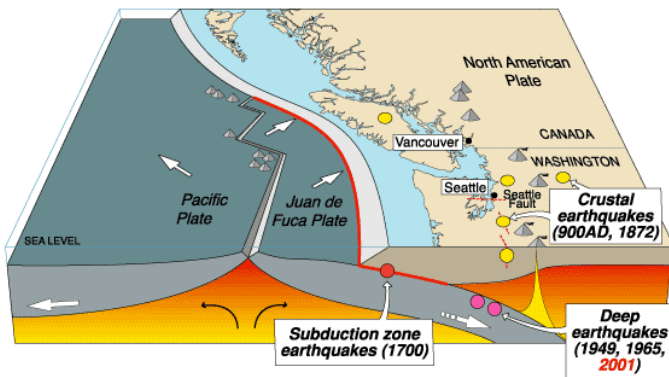
“These earthquakes ruptured right through areas that had been considered to have low risk,” said Lay. “We thought that would not happen. But it did, so we have to adjust our understanding.”

Perhaps the best recent analogy to Cascadia is off the coast of Iquique, Chile, said Lay. There had been a great quake in 1877, and a conspicuous gap in quakes ever since. Like the 1700 Cascadia earthquake, there is little data for the 1877 event, which killed more than 2,500 people. In both subduction zones, the converging plates are thought to be accumulating strain which could be released in a very large and violent rupture. On April 1 of this year, some of that strain was released offshore of Iquique. There was a Mw8.1 rupture in the northern portion of the seismic gap. But it involved slip over less than 20 percent of the region that seismologists believe to have accumulated strain since 1877.

“We have no idea why only a portion of the 1877 zone ruptured,” said Lay. “But clearly, 80 percent of that zone is still unruptured. We don't have a good basis for assessment of how the rest will fail. It's the same for Cascadia. We don't know if it always goes all at once or sometimes in sequences of smaller events, with alternating pattern. It is prudent to prepare for the worst case of failure of the entire region in a single event, but it may not happen that way every time.”

What is certain is that studying these recent big earthquakes has given geophysicists the best information ever about how they work and point to new ways to begin understanding what could be in Cascadia's future.

Cascadia earthquake sources



Source	Affected area	Max. Size	Recurrence
● Subduction Zone	W.WA, OR, CA	M 9	500-600 yr
● Deep Juan de Fuca plate	W.WA, OR,	M 7+	30-50 yr
● Crustal faults	WA, OR, CA	M 7+	Hundreds of yr?

See also
 Cascadia Subduction Zone : Two
 Contrasting Models of Lithospheric
 Structure
<http://earthquake.usgs.gov/data/crust/cascadia.php>
 and
 Cascadia earthquake graphics
<http://geomaps.wr.usgs.gov/pacnw/pacnweq/casceq.html>.

CEU OPPORTUNITIES

Geomorphic and Ecological Fundamentals for River and Stream Restoration - 17-21

August 2015, Truckee, California

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. This course emphasizes integration of hydrology, hydraulics, sediment transport, geomorphology, aquatic ecology, fisheries, and riparian ecology, and includes field measurements, mapping, and interpretation. Now in its 20th successful year, the course is held at Sagehen Creek Field Station, combining a beautiful natural setting with excellent research and teaching facilities. Course materials include Tools in Fluvial Geomorphology (John Wiley & Sons, 2nd edition 2015), relevant papers in pdf, and printed field and lecture notes. <http://laep.ced.berkeley.edu/courses/riverrestoration>

Sediment Transport in Stream Assessment and Design - 27-31 July 2015, Logan, Utah

This course emphasizes applications of the principles of sediment transport to alluvial channel assessment and design. Principles of open channel flow and sediment transport are combined with watershed-scale, hydrologic and sediment source analysis to place channel assessment and design in the appropriate context. Tools for estimating sediment supply at the watershed to reach level are applied in class exercises. Threshold and alluvial channel design methods are presented along with guidelines for assessing and incorporating uncertainty. The course balances advance reading, lecture, field work, and hands-on exercises for estimating sediment supply, calculating sediment transport rates, and forecasting channel response to water and sediment supply. Intended for participants who are familiar with basic principles of river geomorphology. <https://cnr.usu.edu/streamrestoration/htm/course-information>
<http://sagehen.ucnrs.org/courses/geomorph.htm>



Don't forget to
pay your dues
this month.
Membership
renewal is
January 1st.

ROLIS DESCENT IMAGE

The ROLIS (ROsetta Lander Imaging System) instrument is a down-looking imager that acquires images during the descent and doubles as a multispectral close-up camera after the landing. The aim of the ROLIS experiment is to study the texture and microstructure of the comet's surface. ROLIS is a descent and close-up camera on the Philae Lander. It has been developed by the DLR Institute of Planetary Research, Berlin. The lander separated from the orbiter at 09:03 GMT (10:03 CET) and touched down on Comet 67P/Churyumov–Gerasimenko seven hours later. **67P/C-G** is a comet with a current orbital period of 6.45 years, a rotation period of approximately 12.4 hours and a maximum velocity of 135,000 km/h. Churyumov–Gerasimenko is approximately 2.5 mi by 2.7 mi at its widest and longest dimensions
http://www.esa.int/spaceinimages/Images/2014/11/ROLIS_descent_image
<http://en.wikipedia.org/wiki/67P/Churyumov%E2%80%93Gerasimenko>
[http://en.wikipedia.org/wiki/Philae_\(spacecraft\)](http://en.wikipedia.org/wiki/Philae_(spacecraft))



The image shows comet **67P/CG** acquired by the ROLIS instrument on the Philae lander during descent on Nov 12, 2014 14:38:41 UT from a distance of approximately 3 km from the surface. The landing site is imaged with a resolution of about 3m per pixel.



Philae on the comet

Artist's impression of Rosetta's lander Philae (front view) on the surface of comet 67P.

FROM YOUR GSNH NOMINATING COMMITTEE by Abby Fopiano

Thanks to everyone who helped run the Board of Director's election at the October dinner meeting! We had a great turnout with many members casting ballots. A huge thank you goes to our outgoing President Julie Spencer for all the hard work she has given GSNH over the years. Julie will remain on the Board as our Past-President.

The newly-elected Board includes:

President: Wayne Ives

Society Vice President: Thor Smith

Council Vice President: Russell Wilder

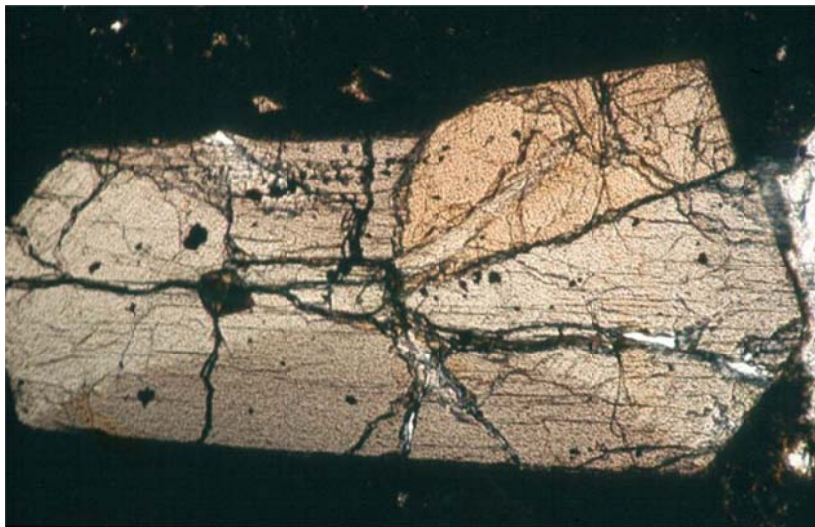
Treasurer: Bill Abrahams-Dematte

Secretary: Lea Anne Atwell

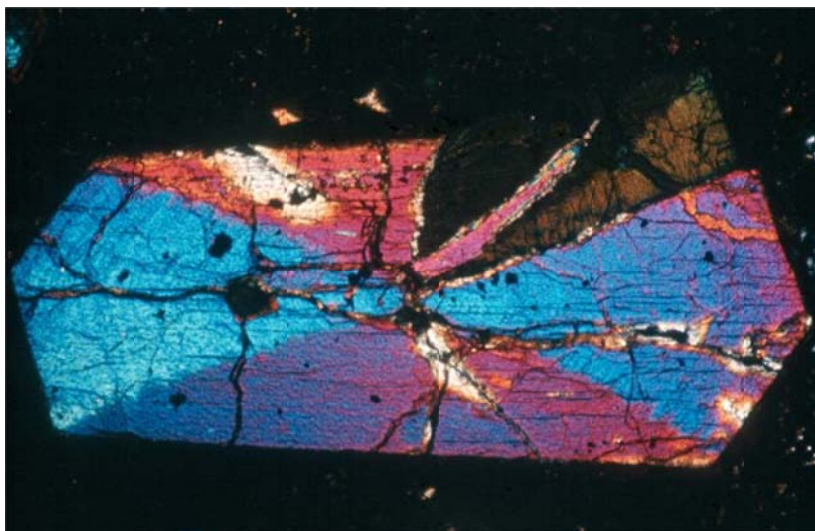
Members-at-Large: Doug Allen, Erin Kirby, Abby Fopiano

New to the Board: Abby Fopiano - Abby is a Water Systems Consultant at Epping Well & Pump Co. Inc. where she is the lead hydrogeologist for projects pertaining to residential, commercial and small community water systems treatment and distribution. Abby is NH Professional Geologist, has a Geology degree from the University of Montana, Missoula, and a masters in Hydrology from the University of New Hampshire. She's been serving as the Society's co-web master for the last year.

LIMBURGITE? – IT DOESN'T LOOK LIKE CHEESE?!



Shown at left are thin sections of [Limburgite](#), an [augite](#) composed of [olivine](#) and glass-bearing, [tephritic volcanic rock](#). The top view is shown under [plane polarized light](#) and the bottom view under [crossed polarized light](#).



These specimens, several millimeters across, date from the [Miocene](#) and were found in the [Kaiserstuhl Hills](#) of southwestern Germany. Both views portray what is called hourglass [zoning](#). The occurrence of this [mafic](#) rock in close proximity to the [Rhine River](#) made it convenient to quarry during the 19th century.

NY LEGISLATIVE UPDATE—GOVERNOR CUOMO HAS SIGNED THE BILL TO LICENSE PROFESSIONAL GEOLOGISTS IN NEW YORK STATE

Excerpted from a November 25, 2014 notice from the NY State Council of Professional Geologists

The NYSCPG is pleased to announce that on Friday, November 21, 2014 Governor Andrew Cuomo signed into law the bill to establish the profession of geology in New York State. This achievement has been approximately 20 years in the making and is the result of the hard work of many volunteers across the state, both through NYSCPG and behind the scenes in many facets. We also cannot overlook the financial support of many people and organizations that helped fund this monumental achievement.

The signing of the law has brought the subject to the forefront and many people have asked questions regarding the implementation of the law and how this will affect professionals wishing to obtain a license. The law has an effective date of two years, meaning that licensure will begin on November 21, 2016. The two-year window is to provide SED the proper time to produce the regulations to add geology to the list of professions in the state of New York. This period will be followed by a one year

grandfathering period in which a license can be obtained by a qualified person without the requirement of passing a written exam. Passage of an exam will be required after November 21, 2017. It is the goal of NYSCPG to use the national exam produced by ASBOG, but this will need to be written into the still-to-be-crafted regulations.

The law states that a candidate must be qualified to apply for a professional license in New York. A qualified person is defined by:

Education: Have received an education, including a Bachelor's or higher degree in geological sciences, in accordance with the regulations.

Experience: Have at least five years of practical experience satisfactory to the Board in appropriate geologic work; up to one year of experience may be credited for an advanced degree (Masters, Doctorate, or an equivalent thereof) in accordance with the regulations.

Age: Be at least 21 years of age.

Character: Be of good moral character as defined by SED.

Twelve years of practical experience in geological work of a grade and character satisfactory to the Board may be accepted to replace the Education and Experience requirement.

The fee structure of the licensing law requires the payment of an initial application fee of \$220 plus the triennial licensing fee of \$210. A one-time fee for person taking the written exam will be added to the initial fee schedule once an exam cost is determined. The initial licensing fee total will be \$430 plus exam fee, if required. The renewal fee will be \$210 every three years, resulting in a \$70 per year licensing maintenance fee.

A common misconception has been that everyone will be required to hold a professional geologist license. Anyone who wishes to become an owner, officer, etc. of firms offering geological services, individuals wishing to provide professional services, and future state officers and employees of a certain grade will be required to possess a license. Employees working under a licensed professional, person working for a firm offering engineering services, and current state officers and employees will not be required to hold a license. This is analogous to the current practice of professional engineering.

Corporations conducting business in geology-related fields in New York will need to re-incorporate with the NYS Department of State into Professional Corporations. A company offering services labeled as strictly engineering would not need to re-incorporate, but will not be able to advertise professional geology services nor use any employees professional geologist's stamp. Significantly, this law will now allow geologists to enter partnerships with members of our sister professions. More details on the corporation refiling need and process will follow in the coming months through the NYSCPG newsletter.

<http://www.nyscpq.org/>

THE NH GEOLOGICAL SURVEY GROUND WATER LEVEL NETWORK SUMMARY

Submitted by Lee Wilder of the NHGS

August 2014 NH Groundwater level measurements were collected by the NH Geological Survey from August 20 - 29, 2014. The statewide August 2014 average groundwater level for **wells in the overburden** (in soils on top of the bedrock) showed a decrease of -0.10 feet from July 2014. When compared with August 2013, the statewide average groundwater level for August 2014, in these wells, increased +0.37 feet. The August 2014 average groundwater level in the new **bedrock wells** showed an increase of +0.10 feet when compared with July 2014. When compared with August 2013, the bedrock wells showed an increase of +0.77 feet for August 2014.

September 2014 NH Groundwater level measurements were collected by the NH Geological Survey from September 23 - 29, 2014. The statewide September 2014 average groundwater level for **wells in the overburden** (in soils on top of the bedrock) showed a decrease of -0.83 feet from August 2014. When compared with September 2013, the statewide average groundwater level for September 2014, in these wells, decreased -0.51 feet. The September 2014 average groundwater level in the new **bedrock wells** showed a decrease of -0.34 feet when compared with August 2014. When compared with September 2013, the bedrock wells showed a decrease of -0.90 feet for September 2014.

October 2014 NH Groundwater level measurements were collected by the NH Geological Survey staff and volunteers from October 27 - 29, 2014. The statewide October 2014 average groundwater level for **wells in the overburden** (in soils on top of the bedrock) showed an increase of +0.52 feet from September 2014. When compared with October 2013, the statewide average groundwater level for October 2014, in these wells, increased +0.50 feet. The October 2014 average groundwater level in the new **bedrock wells** showed an increase of +0.58 feet when compared with September 2014. When compared with October 2013, the bedrock wells showed a decrease of -0.23 feet for October 2014.

November 2014 NH Groundwater level measurements were collected by the NH Geological Survey staff and volunteers from November 24 – December 2, 2014. The statewide November 2014 average groundwater level for **wells in the overburden** (in soils on top of the bedrock) showed a decrease of -0.06 feet from October 2014. When compared with November 2013, the statewide average groundwater level for October 2014, in these wells, increased +0.48 feet. The November 2014 average groundwater level in the new **bedrock wells** showed an increase of +0.28 feet when compared with October 2014. When compared with November 2013, the bedrock wells showed an increase of +0.19 feet for November 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>.

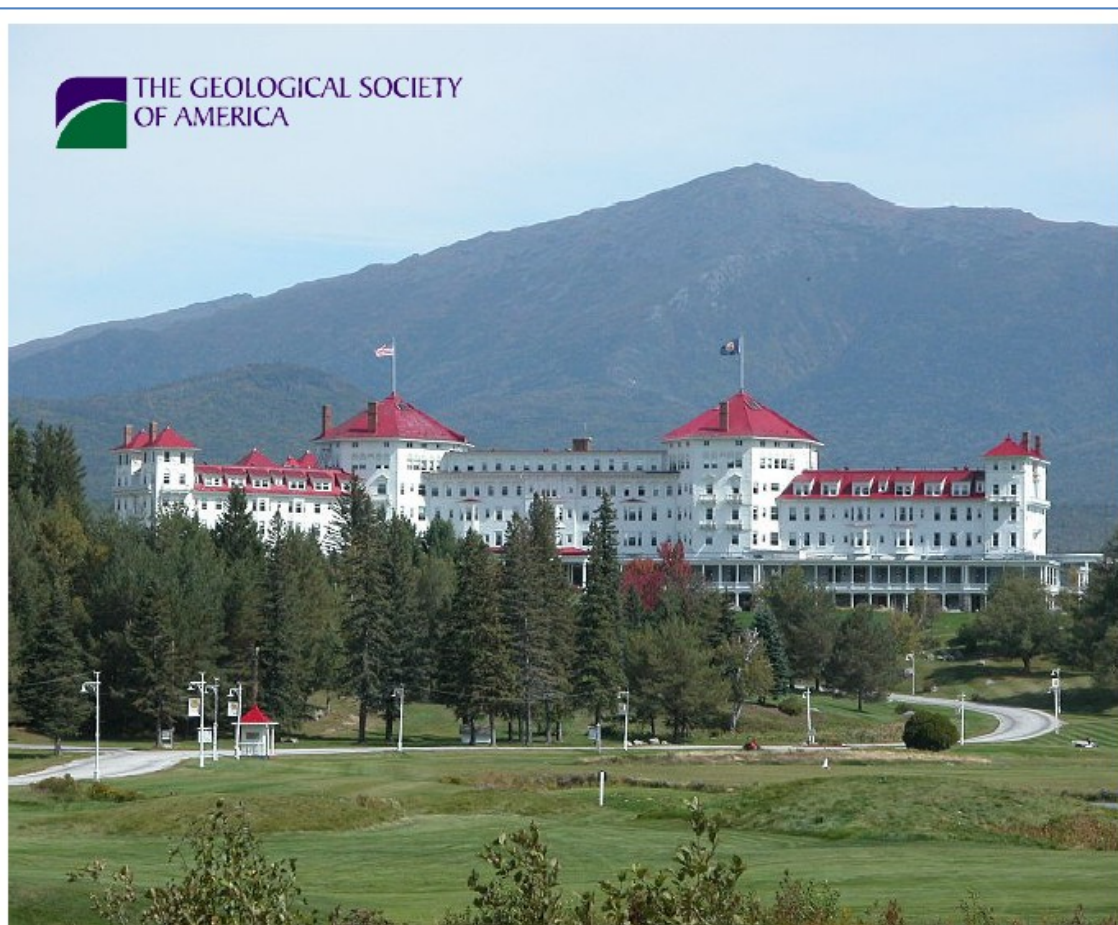
CLIMATE TOOLS SEEK TO BEND NATURE'S PATH By Henry Fountain 11/9/14

UTRECHT, the Netherlands — The solution to global warming, Olaf Schuiling says, lies beneath our feet. For Dr. Schuiling, a retired geochemist, climate salvation would come in the form of [olivine](#), a green-tinted mineral found in abundance around the world. When exposed to the elements, it slowly takes carbon dioxide from the atmosphere. Olivine has been doing this naturally for billions of years, but Dr. Schuiling wants to speed up the process by spreading it on fields and beaches and using it for dikes, pathways, even sandboxes. Sprinkle enough of the crushed rock around, he says, and it will eventually remove enough CO₂ to slow the rise in global temperatures. "Let the earth help us to save the earth," said Dr. Schuiling, who has been pursuing the idea single-mindedly for several decades and at 82 is still writing papers on the subject from his cluttered office at the University of Utrecht. Once considered the stuff of wild-eyed fantasies, such ideas for countering climate change are now being discussed seriously by scientists. The National Academy of Sciences is expected to issue a report on geoengineering later this year.

Turning Down the Heat - Some scientists and policy makers say that the world may someday have to consider geoengineering — intentionally manipulating nature — to combat climate change. One approach is to remove some carbon dioxide from the atmosphere so it would trap less thermal energy. Another is to make the atmosphere more reflective, by adding particles or altering clouds, so less heat is trapped. **Mimicking a Volcano** - In 1991, the [eruption of Mount Pinatubo](#) in the Philippines spewed the largest cloud of sulfur dioxide gas ever measured into the high atmosphere. The gas quickly formed tiny droplets of sulfuric acid, which acted like minuscule mirrors and reflected some of the sun's rays back into space. For the next three years, average worldwide temperatures fell by more than one degree.

But critics, including some in the geoengineering community, say that plans like Dr. Schuiling's would work too slowly, if at all, and that undertaking them on a global scale would be close to impossible. Removing carbon dioxide from the air might be useful for some limited purposes — Dr. Keith, the Harvard researcher, has a company that is developing a machine to do so — but probably not for saving the planet.

More at http://www.nytimes.com/2014/11/10/science/earth/climate-tools-seek-to-bend-natures-path.html?emc=eta1&_r=2#story-continues-5



Northeastern Section of the
Geological Society of America
50th Annual Meeting

March 23-25, 2015

Mt. Washington Resort, Bretton Woods, NH

NH LEGISLATIVE UPDATE – From Russ Wilder

These are the 2015 LSRs filed as of 12/3/2014 that may be of interest to members. Send suggestions/interests for tracking to Russ Wilder at russwilder@msn.com.

2015-H-0030-R	title:	relative to energy infrastructure corridors.
	Sponsors:	(Prime) Suzanne Smith
2015-H-0033-R	title:	relative to eminent domain on public lands.
	Sponsors:	(Prime) James Belanger
2015-H-0034-L	title:	relative to taking land for high pressure gas pipelines.
	Sponsors:	(Prime) James Belanger
2015-H-0038-R	title:	relative to exemptions from seasonal weight restrictions on roads.
	Sponsors:	(Prime) Leon Rideout
2015-H-0046-R	title:	relative to removal of members from land use boards.
	Sponsors:	(Prime) Glenn Cordelli
2015-H-0068-R	title:	relative to the issuance of mining permits.
	Sponsors:	(Prime) John Hunt
2015-H-0076-R	title:	relative to idling by diesel locomotives.
	Sponsors:	(Prime) Norman Major
2015-H-0097-R	title:	relative to hazardous materials incident reporting.
	Sponsors:	(Prime) Jacqueline Cali-Pitts
2015-H-0119-R	title:	designating the mastodon as the official state fossil.
	Sponsors:	(Prime) David Borden
2015-H-0152-R	title:	allowing regulatory boards and commissions to recover certain investigative costs.
	Sponsors:	(Prime) Carol McGuire
2015-H-0192-R	title:	relative to the placement of all new elective electric transmission lines in New Hampshire.
	Sponsors:	(Prime) Laurence Rappaport
2015-H-0197-R	title:	relative to the permissible level of methyl tertiary butyl ether (MTBE) in drinking water.
	Sponsors:	(Prime) Jim McConnell
2015-H-0225-R	title:	directing the university system of New Hampshire to conduct a study of prolonged human consumption of and exposure to methyl tertiary butyl ether (MTBE).
	Sponsors:	(Prime) Jim McConnell
2015-H-	title:	allowing sale of gasoline without ethanol.

0249-R	Sponsors:	(Prime)Donald McClarren
2015-H-0268-R	title:	repealing the New Hampshire regional greenhouse gas initiative program.
	Sponsors:	(Prime)Richard Barry
2015-H-0269-R	title:	relative to local approval of mining permits.
	Sponsors:	(Prime)Franklin Sterling
2015-H-0333-R	title:	repealing an increase in the fuel oil discharge cleanup fund fee.
	Sponsors:	(Prime)James Spillane
2015-H-0410-R	title:	designating the Ham Branch watershed in Easton as a protected river and exempting the Ham Branch watershed from the comprehensive shoreland protection act.
	Sponsors:	(Prime)Susan Ford
2015-H-0413-R	title:	relative to the selection of engineers used as part of the planning board review process.
	Sponsors:	(Prime)Edward Butler

DATES TO REMEMBER

January 15, 2015 – Winter GSNH meeting – Makris Lobster House, Concord

February 17, 2015 – **Deadline for early registration** for Northeast Section Geological Society of America meeting -

<http://www.geosociety.org/Sections/ne/2015mtg/registration.htm>.

Cancellation: 23 February 2015 **Hotel Reservations:** 27 February 2015

March 12, 2014 – GSNH BOD meeting 6pm at NHDES

March 23-25, 2015 - NE-GSA at Bretton Woods, NH (See update in this issue.)

April 16, 2015 – GSNH Spring Dinner Meeting – The Puritan, Manchester

July 6 to July 12, 2015 – Grand Canyon Rafting Trip - contact Fred Beck at fmbeck@fmbeck.net, or Alison Jones at ajones@clearcreekassociates.com.

June 28–July, 01 2015 - 49th US Rock Mechanics/Geomechanics Symposium San Francisco, CA The American Rock Mechanics Association's U.S. annual conference on rock mechanics and geomechanics is June 28-July 1, 2015 at the Westin St. Francis, Union Square, San Francisco. For information on the symposium, accommodations and sponsorship, visit www.armasymposium.org.

September 28-29, 2015 - NGWA Conference on Groundwater in Fractured Rock and Sediments (#5017) Burlington, Vermont the use of innovative techniques, cutting-edge research, and lessons learned from practical experience regarding characterizing and remediating groundwater in fractured rock environments <http://www.ngwa.org/Events-Education/conferences/Pages/5017sep15.aspx>

WHAT IS YOUR BOARD DOING? By Lea Anne Atwell

On December 4th, Thor Smith hosted the quarterly Board meeting at the UGSG offices in Pembroke, NH. We had lots to discuss, including:

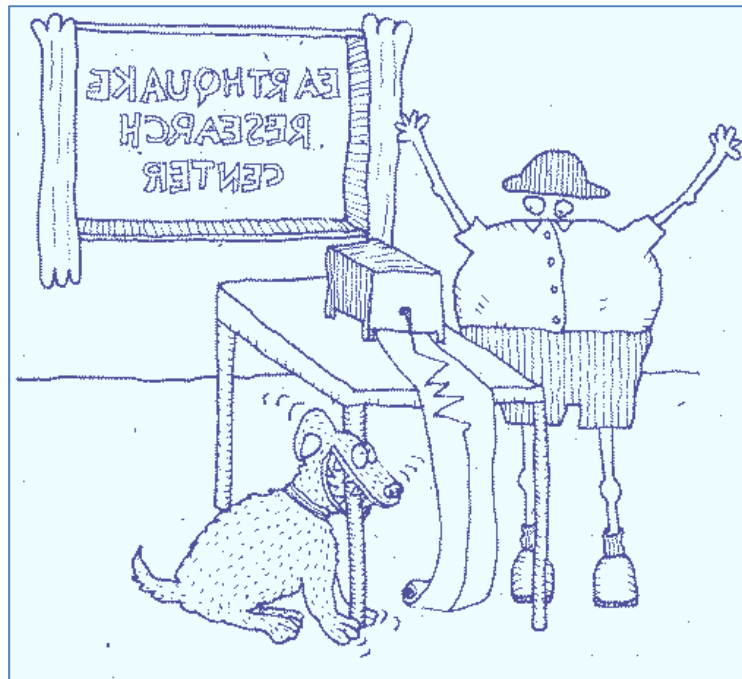
After positive feedback from members at the October dinner meeting, we are moving forward with plans to have at least one of the 2015 dinner meetings at The Puritan in Manchester. Stay tuned for details.

We brainstormed ideas for the Summer 2015 field trip and are considering several stops related to fluvial geomorphology in southern New Hampshire, including the Suncook River avulsion in Epsom, the Buck Street Dam removal in Pembroke, the Amoskeag Fishways in Manchester, and the Souhegan Dam removal in Merrimack. If anyone has any other ideas, or would like to help plan the field trip, we would love your help; please contact a Board member!

GSNH will be using funds raised from our dinner meeting mineral raffles to support teachers who would like to attend the upcoming Northeast Geological Society of America meeting in Bretton Woods, New Hampshire.

Our next meeting will be on Thursday, March 12, 2015 at the NHDES offices in Concord, hosted by Wayne Ives. All members are welcome to attend our Board meetings.

DOGS CAN TELL YOU HOW BIG AN EARTHQUAKE IS.



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

★ **INSPIRING GEOLOGY FOR 50 YEARS** ★



A REMINDER

“MAP & CAREER NETWORKING BLAST” “Connecting Students With Opportunity”

Everyone is seeking motivated and qualified geotechnical employees, but it’s frustrating to find them via usual methods. Here’s a local way to change that.

Come to the **Map & Career Networking Blast** at NEGSA, 2015 to provide your firm or organization with unrestricted access to up to 800 qualified students and professionals seeking employment and internship opportunities. This is a great chance to meet potential employees “on their feet”, without the uncertain formality of usual hiring processes, and over a FREE pizza dinner (cash bar available).

No GSA meeting registration is required for this evening program.

Come by yourself or bring members of your staff, along with a supply of business cards, a project poster or two, or a more elaborate corporate display if you like. Free poster stands and some display tables will be available, and a list of all the event’s attendees (students and professionals) will be distributed to those requesting shortly after the Meeting is over.

For more information, contact Brian Fowler, Meeting Chair (b2fmr@metrocast.net) and visit the Meeting’s frequently updated website: <http://www.geosociety.org/Sections/ne/2015mtg/>.

Please note for planning purposes that all rooms within the OMNI-Mount Washington Resort are reserved for registered NEGSA Meeting attendees. So those who’d like to attend the Blast and spend that night locally, without registering for the Meeting, can make room reservations at the Attitash Grand Summit Hotel in Bartlett, NH, about 20 minutes south of the Resort.

This FREE event is made possible by the generous support of the Northeastern Section of the Geological Society of America and an anonymous member of the Geological Society of New Hampshire.

TABLE OF NE GSA RATES – EARLY REGISTRATION UNTIL FEBRUARY 17

<http://www.geosociety.org/Sections/ne/2015mtg/registration.htm>

REGISTRATION FEES	EARLY		STANDARD	
	Full mtg	One day	Full mtg	One day
Professional Member	\$180	\$130	\$225	\$150
Professional Nonmember	\$200	\$150	\$250	\$185
Professional Member 70+	\$100	\$80	\$130	\$100
Student Member	\$55	\$45	\$75	\$65
Student Nonmember	\$65	\$55	\$85	\$75
K–12 Teacher	\$65	\$50	\$85	\$60
Guest	\$50		\$60	
Field Trip/Workshop only	\$40		\$45	



MEMBERSHIP & RENEWAL APPLICATION

Geological Society of New Hampshire

PO Box 401, Concord, NH 03302

Name: _____ (Please print clearly)

Renewing Members: Only update this section if you have changes to your contact information (including email) or educational history.

New applicants: please complete this section.

E-mail: _____

Preferred address/email to receive GSNH Communication: ___ Home or ___ Business

Home Address:

Business Address:

(Employer): _____

Home Telephone: _____

Office Telephone:

New Hampshire PG # (if applicable) _____

Education: Degrees received or in progress:

Year Degree Major College or University

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

- | | | |
|---|--|---|
| <input type="checkbox"/> Membership Committee | <input type="checkbox"/> Regulations Committee | <input type="checkbox"/> Communications Committee |
| <input type="checkbox"/> Legislative Committee | <input type="checkbox"/> Education Committee | (Newsletter or Website, circle preference) |
| <input type="checkbox"/> Giving a talk at a meeting | <input type="checkbox"/> Events Committee | <input type="checkbox"/> 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: _____