Granite State Geologist

The Newsletter of the Geological Society of New Hampshire,
Summer Edition – June 2014 – Issue No. 85
Newsletter Editor: Wayne.Ives@des.nh.gov **Website:** http://www.gsnh.org/

In this issue:

MESSAGE FROM THE PRESIDENT

Julie Spencer, AECOM, GSNH 2012-2014 President

June is here, the weather is getting warmer and everyone is starting to think about their summer plans. Hopefully those plans will include the geology field trip. This year our friends in the Geological Society of Maine are welcoming members of our group to their field trip to the Bethel, Maine area on July 19 and 20. Look for more information in this newsletter and on our website.

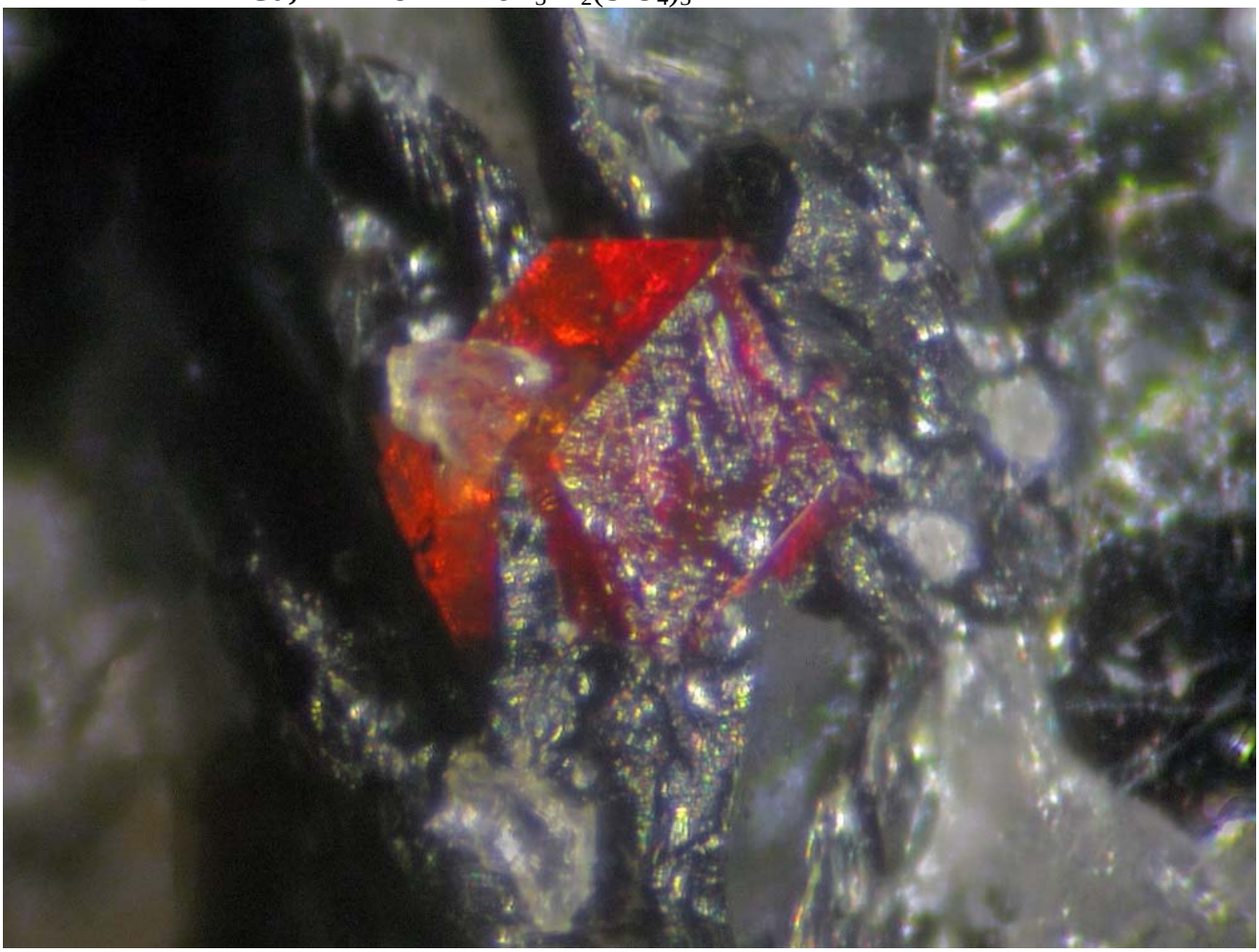
Our April meeting was another great success. Denis LeBlanc from the US Geological Survey treated us to a very interesting talk about groundwater contributing areas to wells and surface waters on Cape Cod near the Massachusetts Military Reservation. During their field study of one of the trichloroethylene plumes using diffusion samplers, they found that a piece of the plume goes under Acushnet Pond, crosses the isthmus and comes out in John's Point. More information about the USGS research can be found at: http://ma.water.usgs.gov/MMRCape .

Mineral raffle prizes that evening were won by Scott Wozniakowski (Smokey Quartz Crystal and Chlorite coated Albite Crystal in Microcline groundmass), Lea Anne Atwell (Twinned mass of Jamesonite) and Chris Griffin (Beryl Crystal shaft in Rhyolite Matrix). Congratulations to all the winners and thank you to the UNH Earth Science Department for the mineral donations. 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.

Did you know that we have an election coming up? Our biennial election for the Board of Directors will be held in October 2014 during our annual meeting. Please consider nominating yourself or others for positions on the board. It is a great way to get more involved with the society and we love having input from new board members! Nominations will be accepted through the end of August. Look for the notice in this newsletter.

On behalf of the board I hope that all of our members have a safe and enjoyable summer. If your travels take you anyplace with some interesting geology please take some photographs to share and we will publish them in a future newsletter!

ALMANDINE - Ca, Mn rich $Fe^{2+}{}_3Al_2(SiO_4)_3$



Locality: Soapstone Quarry, Richmond, NH
Specimen Size: 0.5 mm Almandine garnet
Field Collected: Tom Mortimer -2013
http://mindatnh.org/Richmond%20Soapstone%20Gallery.html

MEMBERSHIP RENEWAL

Woulda-Shoulda. Yes, it's past 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!

Denis LeBlanc receives from president Julie Spencer a token of the Society's appreciation for his presentation at the April meeting on groundwater and surface water interactions at contaminated sites on Cape Cod. (Photo by Doug Allen)

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

NH EARTHQUAKE IS NO BIG SHAKES

A minor earthquake was reported in New Hampshire's North Country early Friday June 20, 2014. The United States Geological Service said the 1.9-magnitude earthquake was reported at 4:41 a.m. just south of Berlin. http://www.fosters.com/apps/pbcs.dll/article?AID=/20140620/AP02/306209973

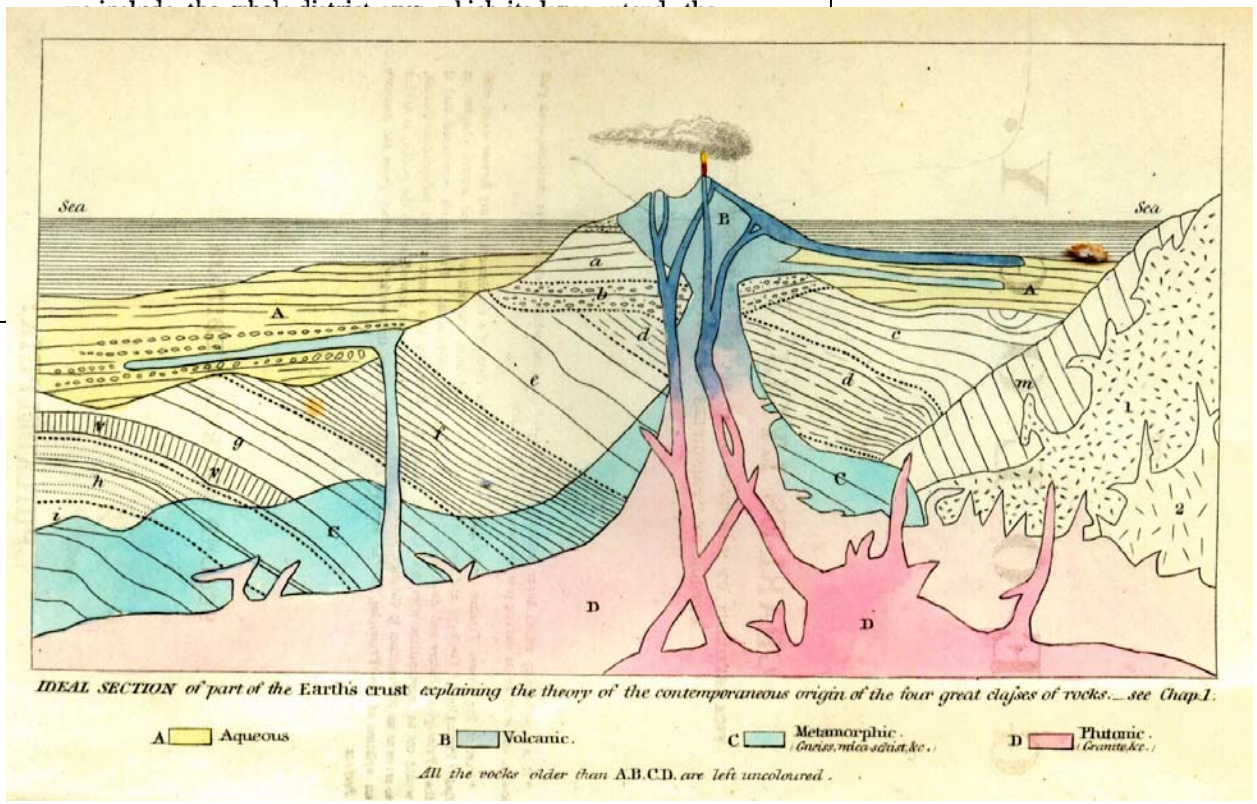
PRINCIPLES OF GEOLOGY VOLUMES 1 - 3 CHARLES LYELL

Below is an example page of the text from Lyell's work in electronic format found at http://www.esp.org/books/lyell/principles/facsimile/. This e-book has a well divided table of contents making navigation easier.

CHAPTER XXI.

External physiognomy of Etna—Minor cones produced by lateral eruptions—Successive obliteration of these cones—Early eruptions of Etna—Monti Rossi thrown up in 1669—Great fissure of S. Lio—Towns overflowed by lava—Part of Catania destroyed—Mode of the advance of a current of lava—Excavation of a church under lava—Series of subterranean caverns—Linear direction of cones formed in 1811 and 1819—Flood produced in 1755 by the melting of snow during an eruption—A glacier covered by a lava-stream on Etna—Volcanic eruptions in Iceland—New island thrown up in 1783—Two lava-currents of Skaptár Jokul in the same year—Their immense volume—Eruption of Jorullo in Mexico—Humboldt's Theory respecting the convexity of the Plain of Malpais.

As we have entered into a detailed historical account of the changes in the volcanic district round Naples, our limits will only permit us to allude in a cursory manner to some of the circumstances of principal interest in the history of other volcanic mountains. After Vesuvius, our most authentic records relate to Etna, which rises near the sea in solitary grandeur to the height of nearly eleven thousand feet *, the mass being chiefly composed of volcanic matter ejected above the surface of the water. The base of the cone is almost circular, and eighty-seven English miles in circumference; but if



IDEAL SECTION of part of the Earth's crust explaining the theory of the contemporaneous origin of the four great classes of rocks.—see Chap.1.

A Aqueous. B Volcanic. C Metamorphic. (Gneiss, mica schist, &c.) D Plutonic. (Granite, &c.)

All the rocks older than A.B.C.D. are left uncoloured.

T

The frontispiece from *Elements of Geology (from http://en.wikipedia.org/wiki/Charles_Lyell)*

WHAT IS YOUR BOARD DOING? By Lea Anne Atwell

The Board gathered for its quarterly meeting at "Toad Hall" in Hopkinton, hosted by Lee Wilder. Key items discussed included:

- Abby Fopiano and Trent Hayden, our co-webmasters, have been working to re-vamp the GSNH website and hope to transition the site to a new webhost this fall.
- Our Dinner Meetings are growing in popularity, and we have almost outgrown our regular meeting venues. In addition, food costs have increased at the Red Blazer. The board has been researching other potential locations to hold Dinner Meetings, including the upcoming October meeting. Erin Kirby has been hard at work leading the search for venues. Stay tuned for more details!
- Elections for the Board of Directors will take place at the Annual Meeting in October. Thor Smith and Abby Fopiano will be running the Nominating Committee. Nominations are due at the end of August. Please contact Thor or Abby if you have any questions about the election or would like to nominate yourself or someone else.
- We are joining forces with the Geological Society of Maine for the upcoming Summer Field Trip on July 19th and 20th. The board voted to help subsidize a portion of the costs for the Saturday evening BBQ for GSNH members who attend. We hope everyone can attend; it looks to be an exciting weekend!
- GSNH will be providing a donation to the Northeast GSA Section Meeting in March 2015 to subsidize the costs for teachers to attend the meeting. This donation comes from funds raised through our mineral raffles, so thank you for your continued support of the raffle.

Our next meeting will be on September 11th at the offices of AECOM in Chelmsford, MA, hosted by Julie Spencer. All members are welcome to attend our Board meetings.

NH GEOLOGICAL SURVEY STUDENT VOLUNTEER Submitted by Rick Chormann

The NHGS has been fortunate to have had Jesse Neff, a third-year student at Northeastern University, volunteering in our office this spring. At Northeastern, Jesse is currently pursuing a Bachelor of Science, with a concentration in Environmental Geology.

Because of Jesse's educational background and likely future directions, NHGS provided him with projects closely aligned with groundwater resources evaluation. Jesse has made significant contributions in entering data from well completion reports into our database and then using GIS to spatially analyze the well locations. In the process, he learned and applied a number of geo-processing techniques.

Jesse has also assisted us with compiling and reviewing data for our surficial geologic map database. In addition, he has spent time in the field, helping to collect monthly groundwater level measurements from the statewide network of observation wells. Jesse tackled all of these tasks with a sense of dedication and humor. His assistance will be missed and we all wish him the best in his future endeavors.

GEOLOGICAL SOCIETY OF AMERICA

NORTHEASTERN SECTION - GOLDEN ANNIVERSARY

MARCH 23 - 25, 2015

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OMNI - MOUNT WASHINGTON RESORT, BRETTON WOODS, NH

WWW.GEOSOCIETY.ORG

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.

3/25/2014	H	**Ought to Pass**: MA Div 282-9
5/15/2014	S	**Ought to Pass**: MA VV, OT3rdg; **SJ 13**

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.

Date	Body	Description
3/5/2014	H	**Ought to Pass**: MA VV
5/15/2014	S	**Ought to Pass**: MA, VV; OT3rdg; **SJ 13**

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.

HB 1100 Establishing a committee to study the ownership by public entities of land for conservation purposes. Prime sponsor: Franklin Bishop. Inexpedient to Legislate: MA Div 247-55

HB 1258 Relative to fill and dredge permitting applications. Prime sponsor: Shannon Chandley.

Date	Body	Description
3/25/2014	H	**Ought to Pass with Amendment #2014-0704h** MA Div 282-9
5/8/2014	S	**Ought to Pass with Amendment** 1637s, MA, VV; OT3rdg; **SJ 12**

HB 1271 Establishing a committee to study the powers and duties of conservation commissions. Prime sponsor: Shawn Jasper.

Date	Body	Description
3/12/2014	H	Refer to Interim Study: MA VV
5/22/2014	H	Interim Study - Full Committee Work Session: 6/3/2014 10:15 AM LOB

HB 1383 Relative to municipal monitoring of large groundwater withdrawals. Prime sponsor: Karen Umberger.

Date	Body	Description
3/26/2014	H	**Ought to Pass with Amendment** #1175h MA VV
5/15/2014	S	**Ought to Pass with Amendment** 1762s, MA, VV; OT3rdg; **SJ 13**
6/4/2014	S	Conference Committee Report 1925c; Adopted, VV; **SJ 15**
6/4/2014	H	Conference Committee Report #1925c; Adopted, VV

HB 1467 Relative to large groundwater withdrawal permits. Prime sponsor: Maureen Mann. Introduced 1/8/2014 and Referred to Resources, Recreation and Development. Inexpedient to Legislate: MA Div 282-9

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.

Date	Body	Description
3/12/2014	H	**Ought to Pass**: MA VV
5/15/2014	S	Refer to Interim Study, MA, VV; **SJ 13**

HB 1220 Relative to limitations on ethanol in gasoline. Prime sponsor: David Campbell.

Date	Body	Description
3/25/2014	H	**Ought to Pass with Amendment #2014-0697h** MA Div 282-9
5/15/2014	S	Refer to Interim Study, MA, VV; **SJ 13**

HB 1229 Relative to the oil discharge and gasoline ether cleanup fund. Prime sponsor: Leigh Webb.

Date	Body	Description
3/25/2014	H	**Ought to Pass**: MA Div 282-9
5/8/2014	S	**Ought to Pass**: MA, VV; OT3rdg; **SJ 12**

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.

Date	Body	Description
3/27/2014	S	**Ought to Pass with Amendment** 1099s, MA, **RC** 13Y-11N; OT3rdg; **SJ 8**
4/23/2014	H	**Ought to Pass**: MA Div 186-104

SB 334 Relative to certification and licensure for mold assessment or remediation services. Prime sponsor: Peggy Gilmour.

Date	Body	Description
1/3/2014	S	**Introduced** 1/8/2014 and Referred to Executive Departments and Administration
3/5/2014	S	Committee Report: Referred to Interim Study, 3/13/14; Vote 5-0; CC; **SC9**
3/13/2014	S	Refer to Interim Study, MA, VV

SB 267 Extending the effective date for integrated land development permits. Prime sponsor: Bob Odell.

Date	Body	Description
3/27/2014	S	**Ought to Pass**: MA, VV; OT3rdg; **SJ 8**
5/14/2014	H	**Ought to Pass**: MA VV

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

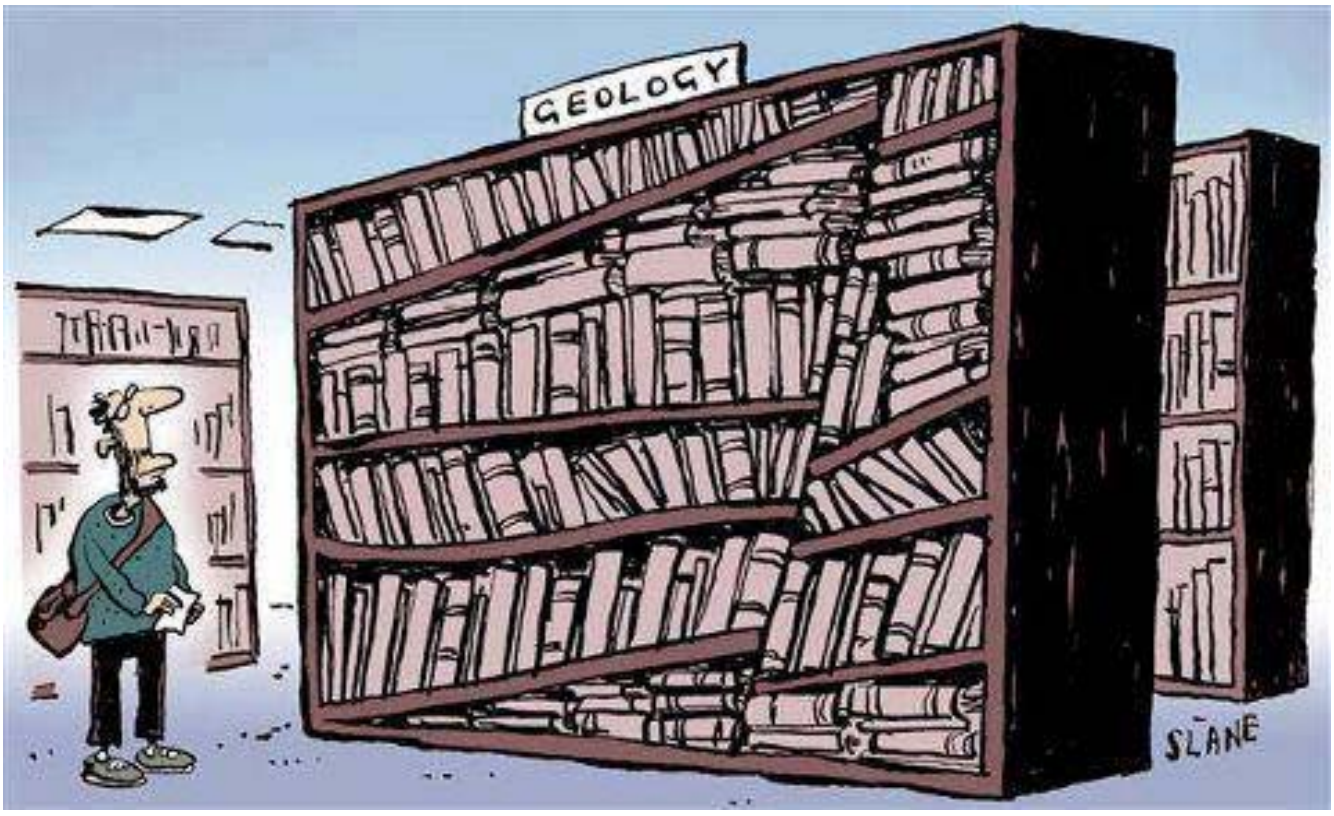
Date	Body	Description
3/6/2014	S	Ought to Pass with Amendment 0693s, MA, VV; OT3rdg; SJ 6
4/23/2014	H	Ought to Pass: MA VV
5/28/2014	S	Signed by the Governor on 05/27/2014; Chapter 0077; Effective 01/01/2015

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.

Date	Body	Description
1/8/2014	S	Introduced and Referred to Energy and Natural Resources
3/27/2014	S	Ought to Pass: MA, VV; OT3rdg; SJ 8
5/14/2014	H	Ought to Pass: MA RC 216-60

NE GSA 2015 UPDATE from Brian Fowler

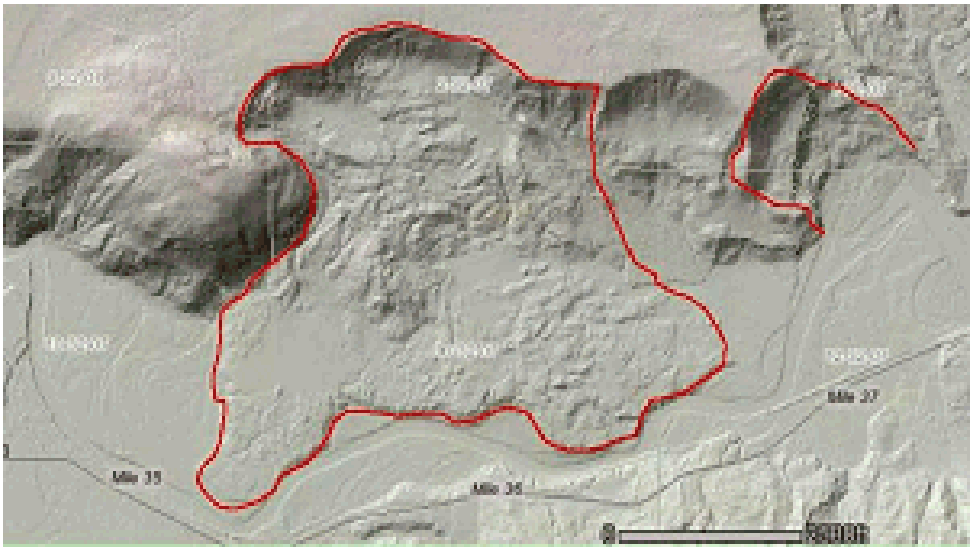
We are plugging along with the preliminary planning activities, which are really not very interesting. GSA will be sending out the meeting's Preliminary Announcement sometime in July, and thereafter more information will available.



THE 2014 OSO, WASHINGTON LANDSLIDE: COMPLETELY FORESEEABLE

By Andrew Alden March 25, 2014

The large, deadly landslide that struck near the town of Oso, Washington on March 22 was a slow-motion tragedy. The first few days were the worst part of it—emergency responders were working without rest to find survivors, yet much of the ground was too dangerous to step on. The anxiety and frustration must have been terrible. So I grant slack to the weary manager of the county's emergency management department, who told the press, "The area was mitigated very heavily. It was considered very safe. This was a completely unforeseen slide. This came out of nowhere." Many people who don't know geology think that way. To geologists, what he said was mostly incorrect.



This is an area of large, well-mapped landslides. Washington geologist Dan McShane writes a blog, Reading the Washington Landscape, where he's been pulling up background information on the slide and its neighborhood. (I've had it in my Washington Geology resource list for some time.) The landscape has landslides written all over it. As McShane put it on the day of the slide, "Landslide wonks knew exactly where this slide was as soon as it made the news." Later he posted lidar maps of the area, showing the landscape with all trees and buildings removed. Take a look.

Outlines in red, made by McShane from county data, show some of the landslide areas. The area of last weekend's slide is the one on the right. That is to say, the latest slide was in the scar of an older one. In fact, the lower part of that older slide moved again in 2006, pushing the river southward. The area of the 2006 slide is the part that was "mitigated very heavily," meaning that the ground was drained and wreckage cleared up. Such steps can stabilize small landslide deposits, but they can't stop unstable mountainsides from collapsing over and over.

I have no doubt that the geotechnical engineers and geologists who dealt with that 2006 slide knew the overall situation perfectly well. But scientists, for better or worse, aren't in charge of things, and people determined to do what they want can't easily be made to understand the risks they're taking. Until the ideal world arrives, people need to learn on their own.

The technology that could help is easily envisioned. Sprinkle a bunch of RFID chips (or even just distinctive reflectors) on hillsides like this and map them regularly with GPS and lidar. The premonitory signs of landslides like this can be detected and warnings can be issued with good data behind them. The largest non-volcanic landslide in North American history happened just last year, inside the massive open pit of a copper mine in Utah. But because the pit was closely monitored, the workers cleared out 7 hours beforehand and not a soul was injured. The technical details were published January in the open-access journal *GSA Today*.

On the other hand, it would be cheaper just to keep housing away from danger zones.

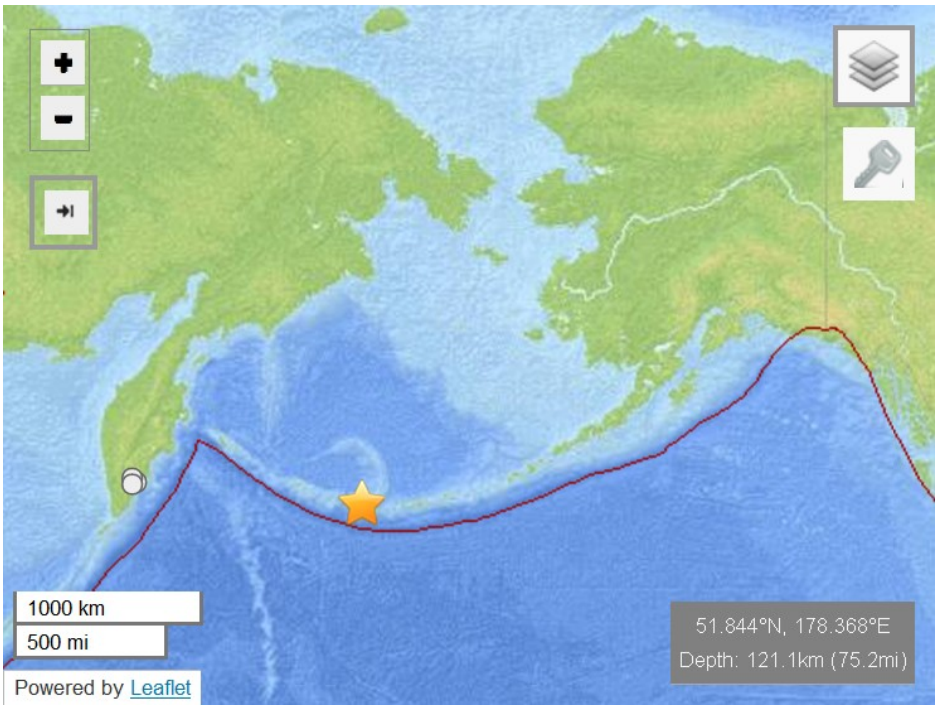
http://geology.about.com/b/2014/03/25/washington-landslide-completely-foreseeable.htm?nl=1

ALASKAN EARTHQUAKES MAKING NEWS

7.9 earthquake near Alaska

By Steve Almasy, CNN
updated 7:44 AM EDT, Tue June 24, 2014

(CNN) -- An initial tsunami advisory has been canceled for coastal Alaska. One had been issued after a magnitude 7.9 earthquake struck Monday about 15 miles from Little Sitkin Island, Alaska. The quake had a depth of 71 miles, according to seismologists. The town of Adak evacuated its 150 residents to a shelter about 600 feet above sea level after the initial tsunami warning, City Manager Layton Lockett told CNN. There were no initial reports of quake damage in Adak or on Shemya Island, said Ian Dickson, website manager for the Alaska Earthquake Information Center. Dickson said there were 17 measurable aftershocks in the two hours after the quake.



First estimates put the quake at magnitude 8.0. The strength was subsequently set by the U.S. Geological Survey at 7.9 magnitude. http://www.cnn.com/2014/06/23/us/alaska-earthquake/

Earthquake swarm near Noatak continues, puzzling scientists

Jillian Rogers The Arctic Sounder June 15, 2014

Another powerful earthquake shook the Northwest Arctic earlier this month. It is the fourth magnitude 5.5 quake to rock the region in six weeks. Like the previous three, last Friday's episode was initiated about 10 miles from Noatak and was measured at a depth of 10 miles.

"The whole house shook," said Herbert Walton, the tribal administrator in Noatak. "We're concerned."

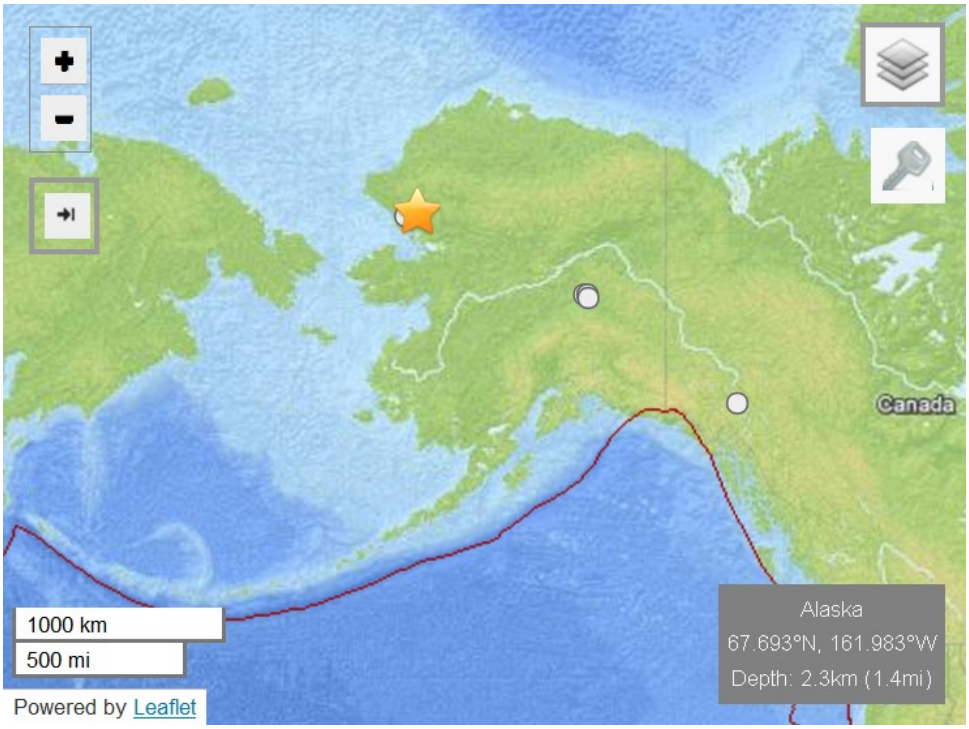
Walton said there was no major damage or injuries that he was aware of, though the first set of quakes in mid-April did cause a few cracks in the IRA building.

"There are plenty of people wondering if there is going to be a bigger one, because every time it happens, they seem to be getting bigger," Walton said.

The first two quakes happened on April 18, while the third shook the area on May 3. All four were about the same magnitude and are now being referred to as an "earthquake swarm," said Mike West, a seismologist with the Alaska Earthquake Center.

The four major quakes have been accompanied by more than 250 "unusually vigorous" aftershocks, West said.

"They all have the same cause; the same fault motion," he said. "And they occur in more or less the same place."



West said vigorous aftershocks are not uncommon, but normally they simmer down over time. The fact that this series of shakes is not losing strength is part of the reason scientists are referring to the occurrences as a swarm, rather than a sequence.

Earthquakes relieve pressure in the earth, and because these strong quakes and aftershocks are still happening, that tells experts that the stress was not fully relieved with the first set of quakes.

"In an area like Noatak, this is very unusual behavior," West said.

Swarms are more common around volcanoes and geothermal sites, but since there are neither in the area in question, West said seismologists are scratching their heads trying to find a comparable episode in mainland Alaska.

Last month, technicians traveled to Kotzebue and Noatak where they held public information meetings and installed temporary seismic stations in both communities. The instruments will allow scientists to better understand what exactly is happening and record all the aftershocks, even the less jarring ones.

"Those two stations are behaving perfectly," West said. "The difference is that we know far more about the earthquake Friday night than we do about the ones in April."

For example, they can now trust the depth reading, and are closer to understanding the orientation of the fault by detecting the smaller aftershocks, all of which is valuable in figuring out why these earthquakes are happening. Experts also know that the fault line spans about 19 miles.

What seismologists still don't know is whether or not a bigger earthquake is on the horizon.

"There is nothing to suggest a larger earthquake; earthquake swarms are characterized by earthquakes of the same size," West said. "But I would be lying if I said there's no possibility of a larger earthquake."

There is no evidence to suggest that the quakes will grow in size, he reiterated.

"It's a very tricky subject. This is a very unusual situation," West said.

Because this is new territory as far as recorded seismic data, those studying the quakes have nothing to compare information to, leaving them limited as far as what they can tell the general public.

As for those in Noatak, Walton said, they are still wondering what all these quakes mean. And each time the ground rumbles, locals are getting calls from surrounding villages asking the same question. Last month, the town meeting in Noatak with the technician from the Alaska Earthquake Center was full with curious locals, but experts are limited on what they can explain because they simply don't know why it's happening or if it will continue.

"This is a significant thing and it's a challenge to raise awareness without becoming alarmist," West said.

http://www.thearcticsounder.com/article/1424earthquake_swarm_continues_to_shake_northwest

MAINE MINERAL & GEM MUSEUM

The astounding Maine Mineral and Gem Museum collection numbers thousands of outstanding and rare rocks, minerals, gems, and meteorite specimens, as well as rare books, maps and mining ephemera. The collection has been assembled in Bethel, Maine by Dr. Lawrence T.P. Stifler and Mary McFadden, Esq., long-time residents of Brookline, MA and Albany Township, ME. Their interest in mineralogy was heightened with the 2005 purchase of the Bumpus Mine, which produced in the mid 20th century some of the world's largest beryl crystals.

The Bethel Planning Board voted to approve the Maine Mineral & Gem Museum site plans to construct the new museum in two adjacent buildings on Main Street in Bethel on June 30, 2012. The museum is still under construction. The former Odd Fellows Hall and 103 Main Street will be joined by historically sensitive new construction to create a 3-story museum building. The Museum will be dedicated to collecting, preserving, and sharing outstanding gems, minerals, objects, and archives to present the history and material culture of mining in the state of Maine.

Temporary offices are located in the Mountain Jewelers building at 57 Main Street in Bethel. Some of the Museum's collection is on display there to preview. Mountain Jewelers is a gift shop featuring custom crafted jewelry made with Maine minerals and gemstones. MMGM will offer tours of mines, as well as natural specimens which tell the story of Maine's geological place in the universe. http://www.mainemineralmuseum.org/page.php?id=1

Maine Mineral and Gem Museum • PO Box 500, 99 Main St., Bethel, ME 04217 • (207) 824–3036

DATES TO REMEMBER

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. 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. This is NHGS's summer field trip, too. See http://www.gsmmaine.org/ for details.

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.

August 23-24 2014 - Capital Mineral Club 51th Annual Gem, Mineral and Jewelry Festival Everett Arena, Concord, NH, Sat 9am to 5pm, Sun 10am to 4pm, www.capitalmineralclub.org,

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

CALL FOR NOMINATIONS

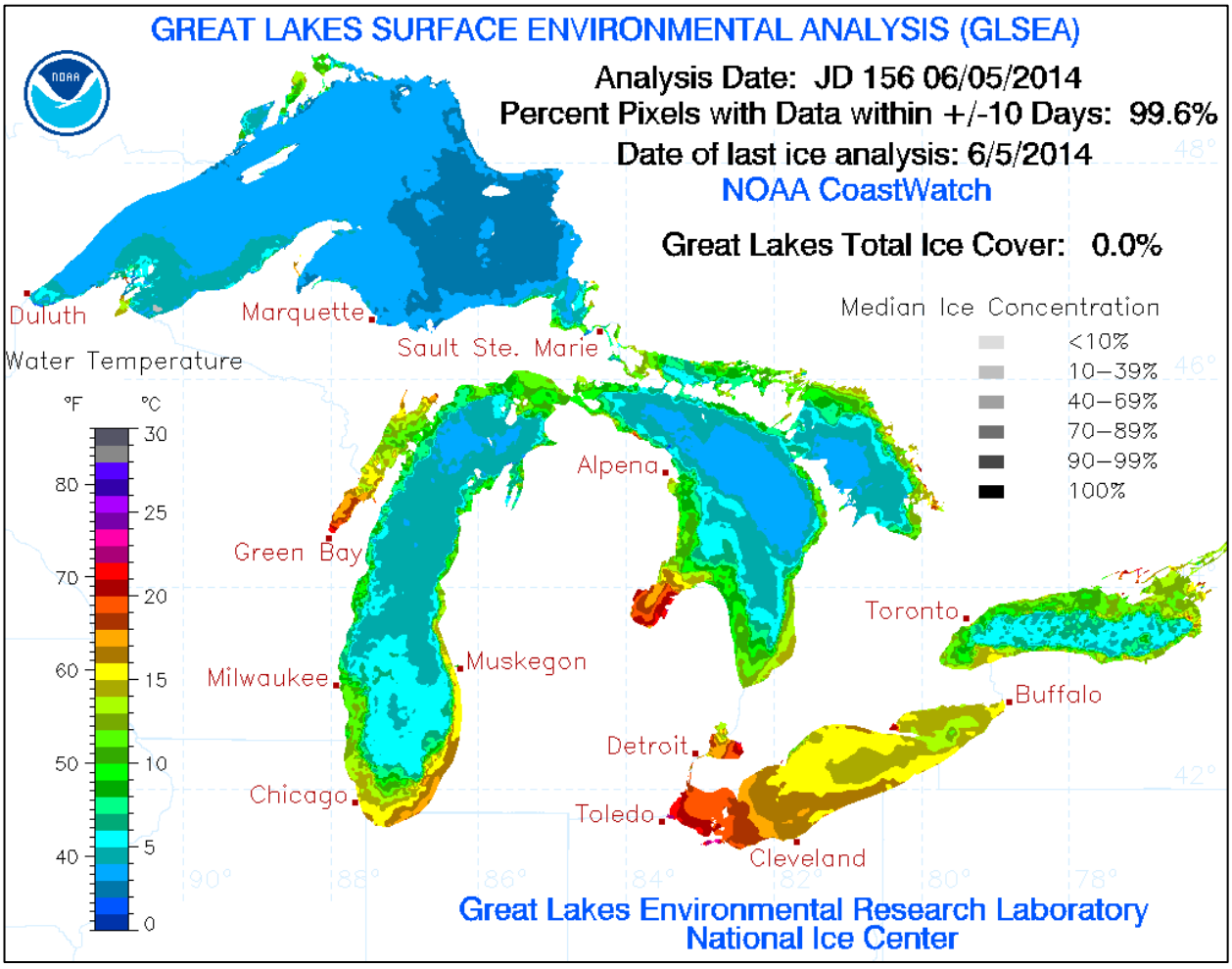
The next election of the board of directors will be coming up in October 2014. This is a great way to get more involved in GSNH! The BOD meets quarterly at the office of a different board member to discuss society business and plan our events. Some of the BOD members also serve as committee chairpersons. There is a lot of camaraderie at the meetings and we always have a lot of fun! Nominations are now being accepted for all positions. Those nominated will be contacted for their acceptance of the nomination and biographical information will be requested for publication with the list of nominees. The slate of candidates will be published in the fall newsletter. Please send nominations to either of the Nominating Committee members: Thor Smith (tesmith@usgs.gov) or Abby Fopiano (abby@eppingwell.com). Nominations will be accepted until August 29, 2014.

GREAT LAKES FINALLY ICE-FREE AFTER RECORD ICE LONGEVITY

By **Kristen Rodman, AccuWeather.com Staff Writer** June 12, 2014; 7:45 AM

With summer just around the corner, for the first time in seven months the Great Lakes are officially free of ice.

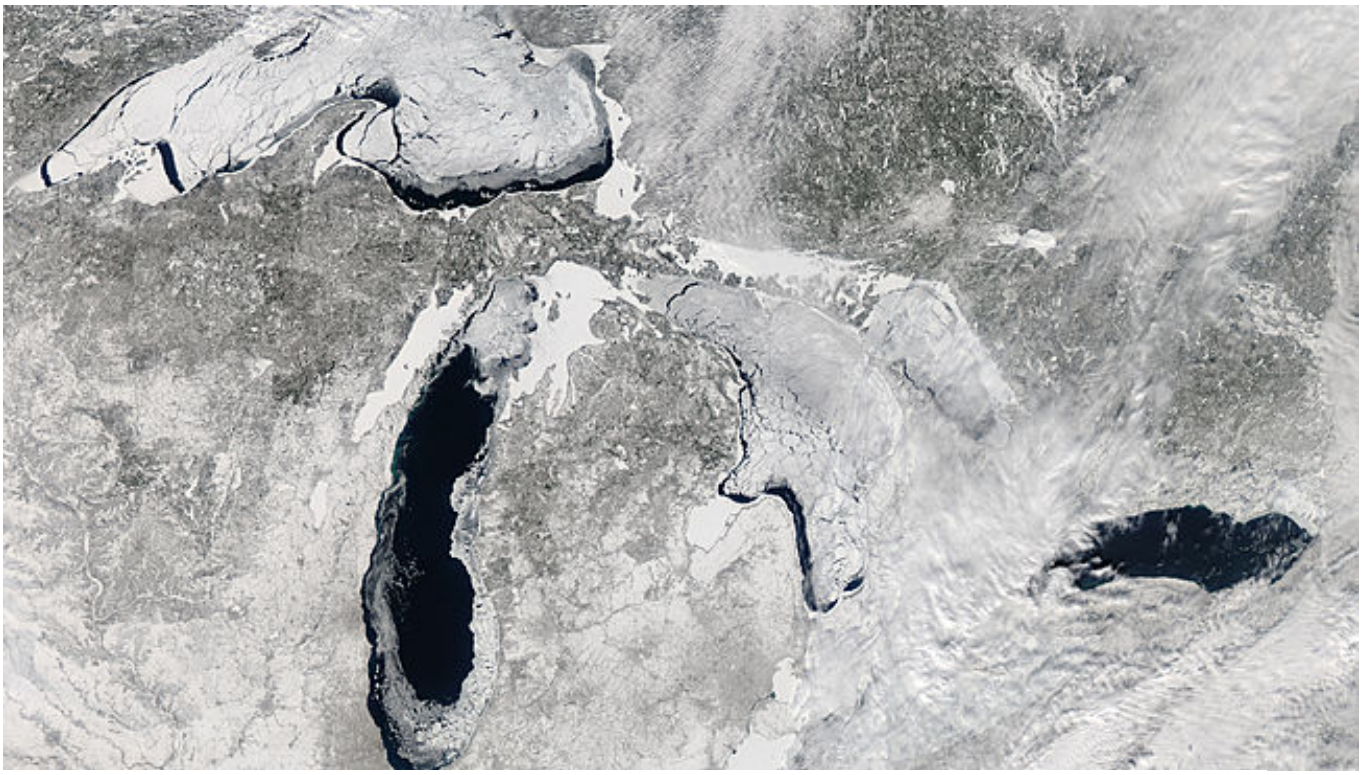
While only weeks ago, chunks of ice could be seen floating on the lakes as residents and visitors flocked to the waters for Memorial Day, as of June 6, the lakes were classified as ice-free.



https://twitter.com/USCG/status/476427774086090753/photo/1

"This year is the longest we've seen ice on Lake Superior in our 40 years of records," Physical Scientist with the National Oceanic and Atmospheric Administration George Leshkevich said.

Following one of the coldest winter's on record for the region with temperatures from Jan. 1 to April 1 averaging seven degrees below normal, the Great Lakes hit their second highest ice coverage on record, reaching 92.19 percent on March 6, 2014.



This image, acquired by the Moderate Resolution Imaging Spectroradiometer (MODIS) on NASA's Aqua satellite, shows the Great Lakes on Feb. 19, 2014, when ice covered 80.3 percent of the lakes. (Satellite Image/MODIS) (http://www.accuweather.com/en/weather-news/record-great-lakes-ice-coverag/25816804)

Moving into the spring season, more than one-third or 38 percent, of the Great Lakes remained covered in ice in mid-April, causing major problems for the steel industry as the business relied on the waterways for shipping and transporting goods and materials.

"There are no years in the last 30 years that are even close to that, so it's very unusual this late in the season to have that much ice coverage," AccuWeather.com Lead Long-Range Forecaster Paul Pastelok said.

The last time the ice coverage on the lakes lasted nearly this long was in 2003, when the last of the ice cleared on May 29, according to Leshkevich.

However, moving farther into the spring season, temperatures began to increase in May, aiding in diminishing the ice coverage on the lakes.

"The air temperature, currents of the water and the water temperatures all play apart in melting the ice," Public Affairs Specialist for the 9th Coast Guard District in Cleveland, Levi Read said.

Since May 1, average temperatures in the Ironwood, Michigan, region have trended slightly above normal with daytime highs in the low 70s and overnight lows in the low 50s.

Aside from rising temperatures across the area, the Coast Guard has been working hard since the beginning of December to break up the ice on the lakes, according to Read.

About a month longer than normal, the service finished ice breaking in the middle of May, Read stated.

Despite the increase in temperatures for the areas surrounding the lakes, the longevity of the cold and the extent of the ice coverage so late into the spring will hinder water temperature recovery.

Currently, the warmest of the lakes, Lake Erie is averaging daily temperatures between 60 and 65 F but the coldest lake has temperatures in the 40s.

"The water is still very, very cold and it's very dangerous for people to go out and get in it," Read said. "The Coast Guard considers anything below 72 F a cold water rescue."

The U.S. Coast Guard Cutters Mackinaw and Neah Bay break track lines for a commercial vessels in Lake St. Clair, Jan. 12, 2010. (Photo/U.S. Coast Guard, Photographer Ensign Guillermo Colom)

Petty Officer 3rd Class Scott Gendron of Coast Guard Air Station Detroit drills into frozen Lake Erie to gather ice depth measurements in support of the National Oceanic and Atmospheric Administration on March 5, 2014. (Photo/ U.S. Coast Guard, Photographer Petty Officer 2nd Class Michael Borsuck)

Swimming in water below 70F can induce a life-threatening health condition known as immersion hypothermia. As water takes heat away from the body almost 25 times faster than air, this condition develops much more quickly than standard hypothermia.

With lake temperatures still lagging as the official start to summer approaches, the prolonged water temperature recovery may have a huge impact on the summer weather for the region including some of the United States' major cities, such as Cleveland, Detroit and Buffalo, New York.

"It's going to affect the overall atmosphere around the region," Pastelok said. "It may be a bit on the cooler side."

In addition to cooler weather for the Great Lakes area, slow-recovering lake temperatures could lead to less severe weather near the lakes and more widespread fog.

RELATED: *Icebergs Spotted in Lake Superior* - 6/11/2014
http://www.accuweather.com/en/features/trend/great_lakes_ice_free_at_last/28517527

THE NH GEOLOGICAL SURVEY GROUND WATER LEVEL NETWORK SUMMARY

Submitted by Lee Wilder of the NHGS

March 2014 - NH Groundwater level measurements were collected by the NH Geological Survey from March 26 – April 01, 2014. The statewide March 2014 average groundwater level for **wells in the overburden** (in soils on top of the bedrock) showed an increase of + 0.32 feet from February 2014. When compared with March 2013, the statewide average groundwater level for March 2014, in these wells, decreased - 0.20 feet. The March 2014 average groundwater level in the new **bedrock wells** showed an increase of + 0.34 feet when compared with February 2014. When compared with March 2013, the bedrock wells showed a decrease of - 0.23 feet for March 2014.

(April and May will be in the next issue of the GSNH newsletter.)

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.

SUMMER FIELD TRIP UPDATE - **July 19-20, 2014** – Wayne Ives

Not much new information yet - keep an eye on the GSM site at http://www.gsmmaine.org/ for the itinerary including where to meet up for the start. This year's summer field trip will be an overnight field trip to the **Bethel-Sunday River** area. GSNH is piggy backing on the Geological Society of Maine field trip with glacial and bedrock stops run by Woody Thompson and Dyk Eusden. There is no sign up or cost. Field trip transportation is on your own (carpool.) Field trips usually from 9AM to 4PM Saturday, 9AM to about 2PM Sunday.

You may still be able to get camping sites at http://www.betheloutdooradventure.com/. 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, 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.

Feel free to direct questions or comments to me at Wayne.Ives@des.nh.gov and I will forward them to GSM and I may be able to update the membership through the GSNH site.

GREEN HILLS PRESERVE - NORTH CONWAY, NH

The Green Hills Preserve is part of a larger matrix of contiguous conservation lands including town land, the Conway State Forest, and the White Mountain National Forest. Nearly 12 miles of hiking trails on the preserve provide moderate to strenuous routes to the summits of Middle Mountain, Peaked Mountain, and Black Cap, and also lead to the town's Pudding Pond conservation area.

A view to the south from Middle Mountain (photo by Ben Kimball)

More than 4,200 acres of this ridgeline and three mountain peaks are protected in the Conservancy's Green Hills Preserve. Here, visitors are rewarded with excellent hiking and opportunities to view unusual red pine rocky ridge habitat and rare plants.

The Green Hills ridge is derived from Conway Granite, a volcanic bedrock formed approximately 200 million years ago. This bedrock is exposed in several places along the ridge, most notably on Middle Mountain, Peaked Mountain, and Black Cap, where visitors are exposed to excellent views as well as lessons in geology and ecology. Peaked Mountain contains great examples of glacial polish, whereby the granite has a smooth, marble-like appearance created when fine grit on the underside of a glacier scours underlying rocks during movement. In the early 20th century, wildfires on the Green Hills burned many of the summit areas and were in large part responsible for the preserve's uncommon red pine rocky ridge community.

http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/newhampshire/placesweprotect/green-hills-preserve.xml

http://nhdfl.org/events-tours-and-programs/visit-nh-biodiversity/green-hills-preserve.aspx

MEMBERSHIP APPLICATION/RENEWAL

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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: _____