



# New Hampshire Geological Survey's Annual Geologic Mapping Workshop 2014

Tuesday March 11, 2014

9:00 AM – 12:30 PM\*

DES Auditorium, NHDES, Concord

29 Hazen Drive, Concord, New Hampshire 03302-0095

## Public Session Agenda (Preliminary)

8:30 – 9:00 AM **Coffee and Poster Session in Auditorium Anteroom\*\***

9:00 – 9:10 **Welcome and NHGS Program Update**

Rick Chormann, NH State Geologist – Programmatic Update

### **Guest speakers:**

9:10 – 9:40 **Jon Kim, Vermont Geological Survey and Ed Romanowicz, SUNY at Plattsburgh –  
“Hydrogeological Analysis of Selected Bedrock Wells in Vermont using  
Geophysical Logs.”**

Over the past two years, the Vermont Geological Survey has partnered with the State University of New York at Plattsburgh to log 17 bedrock wells in Vermont using modern geophysical logging techniques. Temperature, conductivity, gamma (~lithology), caliper (borehole diameter), and acoustic televiewer (radar imaging) data was acquired for each well. This presentation will show the logs from several selected wells (including public wells) and highlight the important hydrogeological findings.

9:40 – 10:10 **Jeremy Nicoletti, New Hampshire Geological Survey – “Detecting Geomorphologic  
Changes – Applying Innovations to Spatial Data Gathering.”**

Structure from Motion (SfM) Photogrammetry is an emerging, viable technology to capture spatial data, being ever improved by innovations from researchers in computer science, geomorphology, archaeology, geography and other fields. It allows the extraction of point clouds from digital photographs using free or commercial software. This technology potentially provides great utility for mapping geomorphic features undergoing rapid change, such as stream banks regularly subject to fluvial erosion processes. To evaluate the potential of SfM for quickly mapping rapidly changing geomorphic features on short-time scales, it was tested on an eroding stream bank on the Suncook River in Epsom, NH. Collected datasets show that precision varies based on the survey scope, level of detail, and the processing workflow used. The preliminary processing of two collected datasets shows how rapid repeat surveys can gather upwards of a quarter million points per half hour of field work with error margins of .3 to .5 feet. Given that traditional methods of measuring temporal geomorphic change at a single site are time-intensive, these results suggest that SfM is a viable improvement.

- 10:10 – 10:40 **Greg Walsh, US Geological Survey – “Status Report of Bedrock Geologic Mapping by the USGS in New Hampshire.”**  
This talk will present the results of ongoing mapping as part of the FEDMAP component of the USGS National Cooperative Geologic Mapping Program. Current work is primarily focused in the Connecticut River Valley region in a four-quadrangle area around Littleton and an eight-quadrangle-area from Lebanon to Alstead.
- 10:40 – 10:55 **Break**
- Mappers’ Reports on Surficial Maps completed in 2013 for the NHGS**
- 10:55 – 11:25 **Brian Fowler, NHGS STATEMAP volunteer - “Surficial Geologic Mapping, Franconia & Lincoln 7.5’ Quadrangles.”**  
Reconnaissance-level surficial mapping of these quadrangles was completed in 2013. Findings of particular interest include the following. On the Franconia quad, work identified a sequential transition in the style of deglaciation from gradual down-wasting to frontal retreat between the slopes of its northern mountains and adjacent valley sections. It also clarified the previously-estimated extent of glaciofluvial and more recent deposition associated with the ancestral and present Gale River and ancestral Glacial Lake Franconia in its lower basin. In contrast on the Lincoln quad, work identified only evidence of down-wasting, but established that it occurred there unevenly and much more rapidly, possibly catastrophically in some places, on and beneath the generally south-facing slopes. Evidence of this ragged more rapid process includes the former presence of residual ice in the Harvard Brook drainage that was of sufficient size and connection to other residual masses to create its own localized eskerine deposits after nearby areas were ice-free. It also includes recognition that what were previously thought to be relatively thick sand and gravel alluvial deposits in the valleys of the Pemigewasset East Branch and Moosilauke Brook are instead a newly-observed form of chaotically deposited, very coarse, clast and matrix supported valley-bottom diamict with variable but relatively thin sand and gravel deposits scattered across their surface along now-abandoned ephemeral drainages and related basins. More detailed mapping, LiDAR and GPR studies, subsurface investigations, and cosmogenic dating are needed to confirm or refute these preliminary ideas.
- 11:25 – 11:55 **Dan Tinkham, John Brooks and Mark Wingsted, Emery and Garrett Groundwater Investigations, LLC – “Surficial Geology of the Plymouth 7.5-minute Quadrangle Grafton County, New Hampshire.”**  
Glaciofluvial and glaciolacustrine deposits graded to Glacial Lake Franklin were mapped within the Baker and Pemigewasset Valleys northward to the confluence with Mad River. The elevations of glacial deposits in the Campton area suggest that active and/or stranded ice within the Pemigewasset Valley resulted in the deposition of glaciofluvial and glaciolacustrine deposits at elevations above Lake Franklin.
- 11:55 – 12:15 **Carol T. Hildreth, – “Surficial Geologic Map of the Waterville Valley 7.5-minute Quadrangle, New Hampshire, 2013.”**  
Waterville Valley quadrangle consists primarily of till and bedrock-covered parts of the rugged glaciated Sandwich Mountain range in the southeast; the Mounts

Welch, Dickey, Tecumseh and neighboring peaks in the central area; and the southern slopes of the Mount Osceola range in the north. The Mad River valley, which courses southward from the northeast to the southwest corner of the quadrangle, contains several sequences of glacial meltwater and younger sediments deposited in fluvial and/or lacustrine settings.

12:15 – 12:25     **John & Anita Cotton, NHGS STATEMAP volunteers – “*Surficial Geology of the Andover 7.5-minute Quadrangle, central New Hampshire.*”**  
Most of the Andover quadrangle is in the Blackwater and Pemigewasset River watersheds. Aggressive erosion by the glacier in the “ice-flow shadow” of Ragged and Tucker Mountains created a broad topographic basin to the southeast. Stratified drift deposits are primarily in this central lowland and the east-west trending Blackwater River valley. Meltwater flowed to the south through a series of temporary control channels in West Salisbury.

12:25             **Questions and closing remarks**  
Rick Chormann, NH State Geologist

### **Private Working Session for NHGS Mappers in the Anteroom**

1:15 – 3:15             Mapping contractor meeting for those who map for the NHGS under the STATEMAP program.

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**Directions to NH Department of Environmental Services**  
**The main offices of DES (including the New Hampshire Geological Survey)**  
**are located at 29 Hazen Drive, Concord, NH.**

#### **From the South and West**

Take I-93 north to Exit 14 turning right at the end of the exit ramp. At the third light (at top of the hill), turn left onto Hazen Drive. Turn left at sign for Health & Human Services. Visitor parking is available in front of building.

#### **From the North**

Take I-93 south to Exit 15E onto I-393. Take Exit 2 and turn left at end of exit ramp (East Side Drive). Stay to the right and turn right at light onto Hazen Drive. Turn right at sign for Health & Human Services. Visitor parking is available in front of building.

#### **From the East**

Take Route 4 west to Concord (Route 4 becomes I-393 in Concord). Take Exit 2 and turn left at end of exit ramp. Stay to the right and turn right at second light onto Hazen Drive. Turn right at sign for Health & Human Services. Visitor parking is available in front of building.

**Note: If you have not already done so, please respond by email if you plan to attend so that we can anticipate the number of attendees. If you need further information on the program or **to R.S.V.P.**, please contact the NH Geological Survey at: [geology@des.nh.gov](mailto:geology@des.nh.gov)**

*Attendance at the entire public session part of the workshop qualifies for 3.5 CEU's*

**Please bring photographic identification (e.g. driver's license) in order to be admitted to the DES Building. Thank you.**

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\* NHDES employees should confirm their attendance and schedule of the workshop with their supervisors.

\*\* Posters will be on display until the end of the public session of the workshop.