Vermont Field Geology

Geology 217—Fall 2018
Tuesdays 8:30–5:30 PM

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Objectives:

My objective in teaching this course is to introduce you to the geology of northern Vermont and its surrounding areas. I hope that this exposure to the state's geology will better prepare you for tackling your own field problems encountered as part of your thesis, class work, or independent work you may do in the future. I also hope to give you the background necessary to effectively teach your introductory and upper level labs while you're in graduate school. An additional objective is to give you experience "reading" the Vermont landscape and translating what you see into words and figures that clearly convey the three-dimensional geometry of rocks and surficial materials at a particular site, the geological processes that are operating or have operated in the past, and your interpretation of an area's history.

Background:

Almost all of my graduate research focused on structural geology where I was describing the geometry of deformed rocks and trying to interpret something about the mountain building processes that deformed the rocks in my field areas. For the last 20 years most of my research efforts have focused on understanding the glacial geology of northern and central Vermont. This work has incorporated an understanding of how the last ice sheet was flowing as it receded across the area, the interaction of melting water, glacial ice, and the underlying sediments and rocks, and the many glacial lakes that occupied the area. During this class I will bring you to some of the better field sites that I and other geologists have found while conducting field work in the area. You will have many questions that I can't answer this fall, but I will try as best I can to find answers for you.

This course has been modeled after the "Fall Field Practicum" that is taught to incoming Field Naturalist graduate students. While our approach will be less broad-based than the Field Naturalists' (i.e. focused on geology), I will incorporate other aspects of the landscape's natural history that have been markedly affected by the geologic history, particularly the human history. A key approach that Field Naturalists use to look at a landscape is to think of "pieces, patterns, and processes." The "pieces" are the individual physical or biotic components of a landscape. "Patterns" result from the way in which those individual pieces are arranged or distributed in a landscape. "Processes" of course are the forces operating both in the present and in the past that are responsible for the patterns. As geologists, we tend to spend most of our energy focused on the past, but it is helpful to think of the present landscape as being dynamic and not static, and to project a landscape into the future as well.

Preparation:

This is an all-day field class designed to introduce you to a wide variety of geologic materials, processes, and landforms. Our field trips begin in the Champlain Valley and then migrate east into the Green Mountains and the Montpelier region. We will take at least one trip across the lake to the Adirondack Mountains. The schedule is flexible so that we can also visit field sites of particular interest to students in the class.

Be ready to go in the field by 8:45 AM each Tuesday. Bring a lunch and expect to be out all day in most weather. We'll try to make at least one bakery/coffee stop for additional food. In most cases we'll be back between 5 to 5:30 PM, but some of our longer trips may keep us away from Burlington longer and we'll try to make special arrangements for those of you with evening commitments.

Outside Readings

The written resources for this course largely come from papers and field trip guides, most of which are available on-line. A number of the papers I will ask you to read are published in the New England Intercollegiate Geological Field Conference (NEIGC) Guidebooks, an annual fall field conference traditionally hosted by one or more of the colleges in different parts of New England and Atlantic Canada. Field trip guidebook articles are not sent out for review, like most scientific journal articles, and are therefore less "authoritative." However, most of the information included in the guidebook articles we will read is not published elsewhere. Furthermore, the guidebooks give descriptions of specific field stops as well as instructions on how to get there. These references will lend added depth to the learning we do outside and provide resources you can use as you prepare your written site descriptions (see below).

Written Reports:

One week after our field trip you should turn in a short field site report. The objective of these site reports is to review of our observations and interpretations, i.e. what did you see and what did you learn? Two to three pages of text is usually sufficient. Sketches, photos, maps, and cross-sections should be an important part of these reports as well as references to the guidebook article or other pertinent literature. It is appropriate to reference any background sources you utilize. I will give you a copy of an old write-up to give you an example of one student's approach. You can write a traditional scientific field report, but please feel free to experiment with other writing styles as well. You will be writing for a variety of different audiences in the future and each demands a different style of writing. In past years I've had students put together one page brochures that one might pick up at a park entrance (formatted to fold into thirds), draw detailed captioned graphics, write "newspaper" articles, and letters to far-away relatives.

Twice during the semester you may choose to not do a write-up. These "outs" may be for field trips you miss because of outside commitments or for field trips you attend, but choose not to write up.