

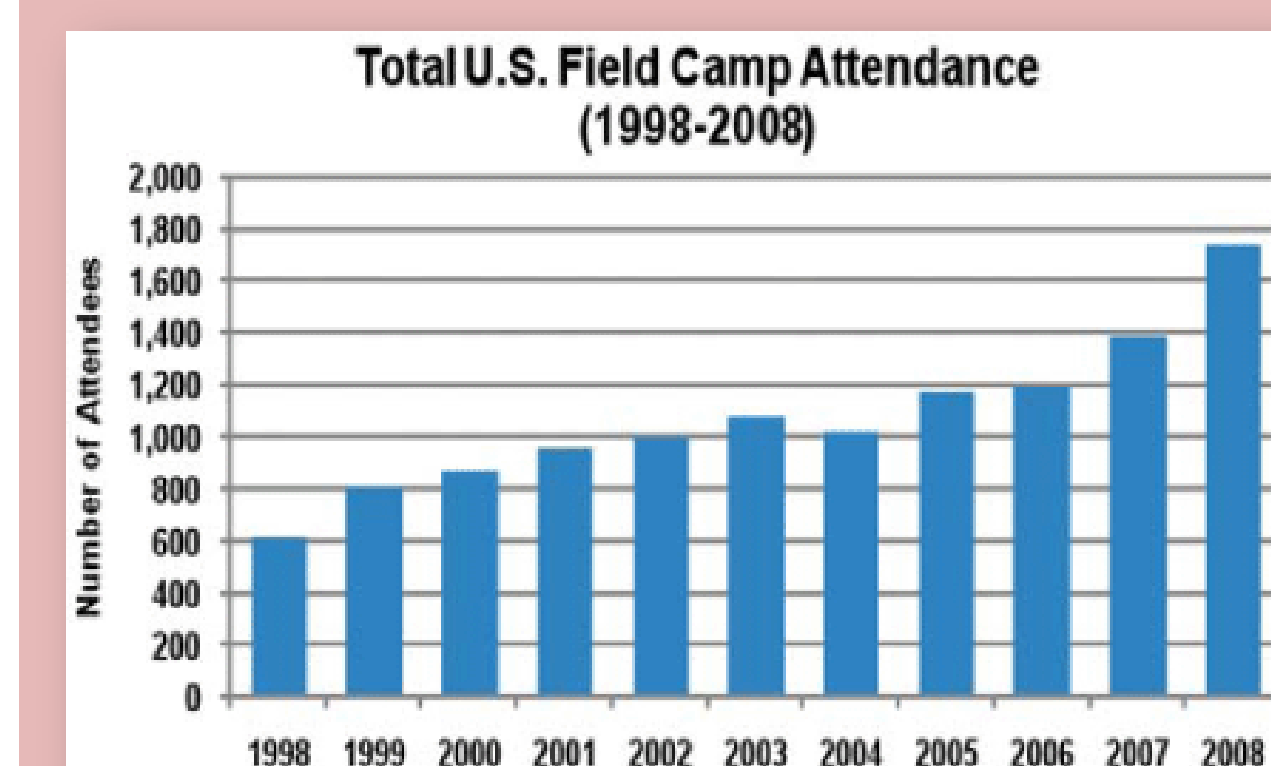
Abstract:

After an absence of more than two decades, the Earth and Environmental Science program at Montclair State University reinstated the Field Camp course in the summer of 2014. We saw several reasons to revive field camp for our growing enrollment. First, studies show a decline in field programs offered nationwide despite an increase in student enrollment, resulting in fewer and more competitive slots. Second, we saw value in providing field experience for our students, building beyond successful weekend field trips with more extensive field-based data collection and interpretation, valuable for entry-level jobs and/or as preparation for graduate school research. Third, we wanted our students to gain perspective beyond New Jersey's varied though often inaccessible geologic history. Showcasing classic geology sites of the western states would add to the students' experience. In three years, 53 Montclair State students have completed the field camp.

Our course is in two sections, two weeks in-residence at our field station (NJ School of Conservation), followed by four weeks in Montana and Wyoming. The team-taught first section focuses on glacial/Holocene surficial geology. The convenient proximity allows us to introduce field technology (GPS and TOTAL station topographic surveys; geophysical methods with ground penetrating radar, electrical resistivity, seismic refraction), accompanied by soil, hydrology, and sedimentology surveys. This section evolved into a project-oriented investigation with student teams, with mixed success. For the second section, taught by a single instructor and TA, students conduct traditional field surveys of petrology, stratigraphy and structure at different sites in Wyoming and Montana to produce geologic maps and stratigraphic sections. These investigations are individually presented, shorter, and benefit from more background information provided to the students. One major benefit to field camp is the use of authentic data, with professors and students investigating problems concurrently. We presented discoveries from the New Jersey geomorphic studies at recent conferences. Given our success, we contemplate inviting students from outside the university, as well as including non-geology students (e.g. sustainability, geography, ecology) in a joint program.

Background

- The Earth and Environmental Studies (EAES) department saw an opportunity to address a need for a capstone field course for the Geoscience (now Earth and Environmental Science) BS program.
- Parallel trend in demand for "field camp" experiences nationwide (figure below, from Whitmeyer, Mogk, and Pyle, 2009).
- At the same time, geoscience educators noted a decrease in the number of field camps offered (Baker, 2006, "Status Report on Geoscience Summer Field Camps". AGI Geoscience Workforce, Report GW-06-003).
- 2003, Montclair State initiated a field camp experience in the Geoscience curriculum. Students used field camps offered by other universities, or were allowed independent study opportunities, in the region or with international research excursions with faculty.
- Following experience with two "tourist" field trips in the US West, and a successful NSF REU program based at the New Jersey School of Conservation (Montclair State's field campus since the 1930s), we undertook planning to offer our own field camp, modeled on the traditional field camp experiences.
- 2014, offered our initial, six-week summer field camp program, two weeks in residence at the New Jersey School of Conservation, followed by four weeks in Wyoming and Montana.




"Total U.S. field camp attendance during the period from 1998 to 2008, as compiled in a survey by Penny Morton, University of Minnesota-Duluth (AGI Geoscience Workforce Program; AGI, 2009)." Whitmeyer, Mogk, and Pyle, 2009. *GSA Special Papers* 461: vii-ix.

REVIVAL OF THE GEOLOGY FIELD CAMP

EXPERIENCE AT MONTCLAIR STATE UNIVERSITY

Session No. 66 Booth# 139




**Gregory A. Pope*¹, Matthew Gorrington¹, Tanya M. Blacic¹,
Joshua C. Galster¹, and William H. Thomas²**

1. Dept. of Earth & Environmental Studies, Montclair State University
2. New Jersey School of Conservation, Montclair State University

* popeg@mail.montclair.edu

www.facebook.com/MSUFieldCamp/



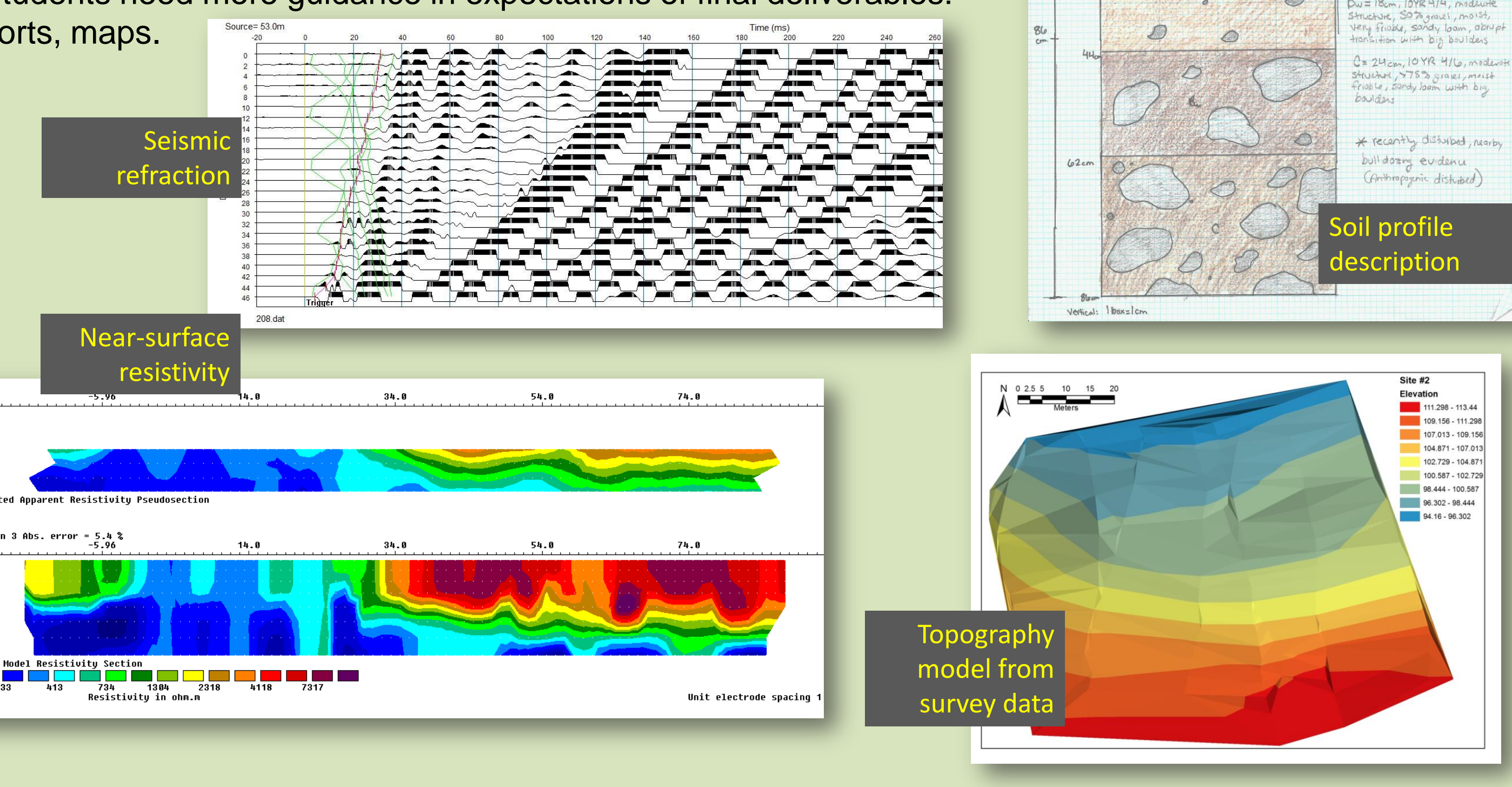
The NJSOC experience

- Geology is entirely late Pleistocene and Holocene glacial and post-glacial deposits, no bedrock.
- First day involves a walk-through of site of geomorphic interest, origin unknown to students. They are asked to observe landscape and sediment features.
- Remainder of field investigation involves and intensive survey of a small site of geomorphic interest, near NJSOC. The approach is "research-like", explaining the geomorphic history of the site. We introduce the premise of a site investigation for a client. Use of field technology.



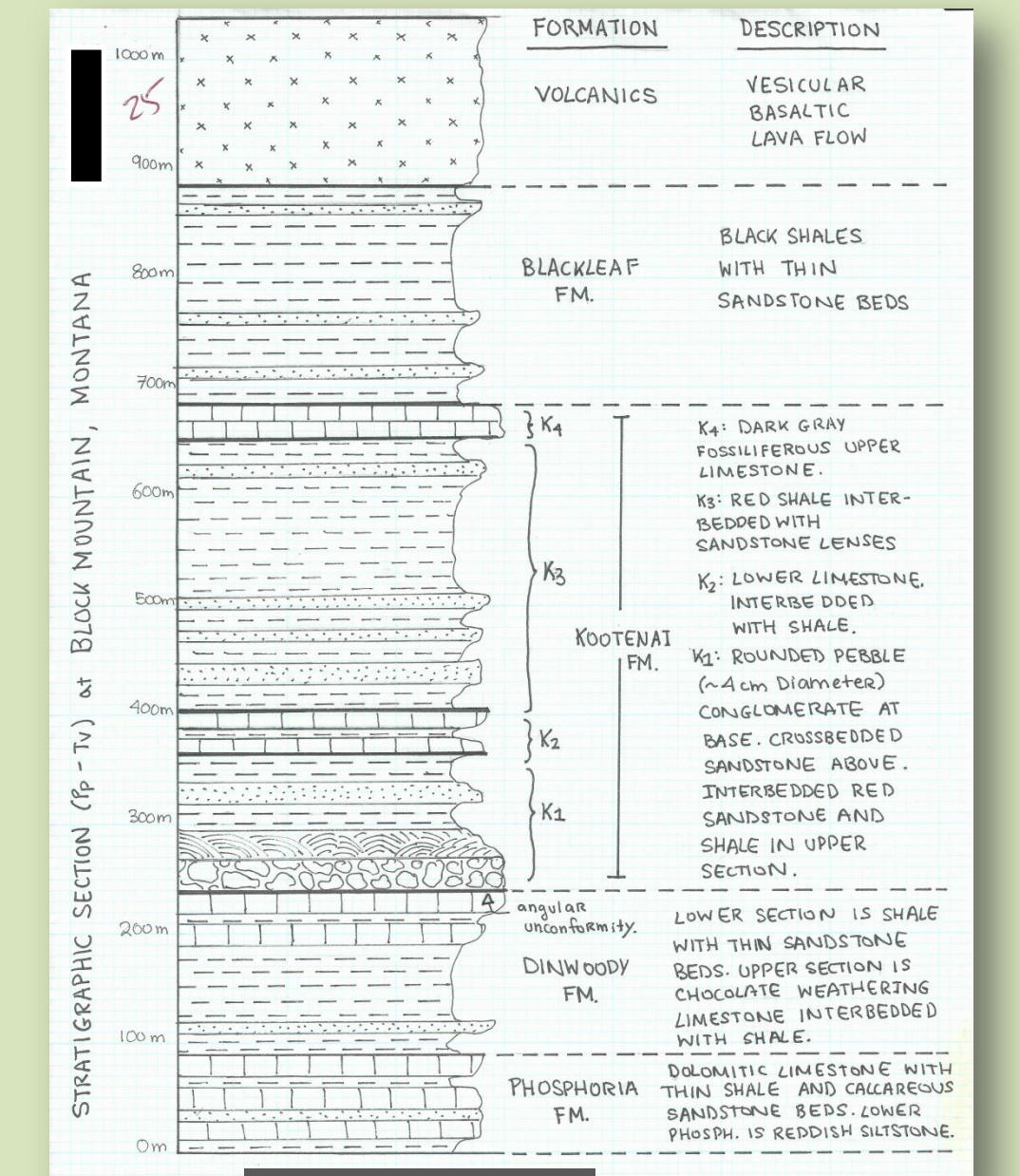
Successes and not quite successes:

- ❖ Not all sites are good for use of all field technology, requires scoping out as well as trial and error.
- ❖ Student teams (3-4 students) work well, especially when given non-overlapping territory. Each student team produces a final report and oral presentation or their site, applying all methods.
- ❖ Students like learning the new tools, applicable to future employment. Tools are relatively easy to transport from main campus.
- ❖ Students need more guidance in expectations of final deliverables: reports, maps.

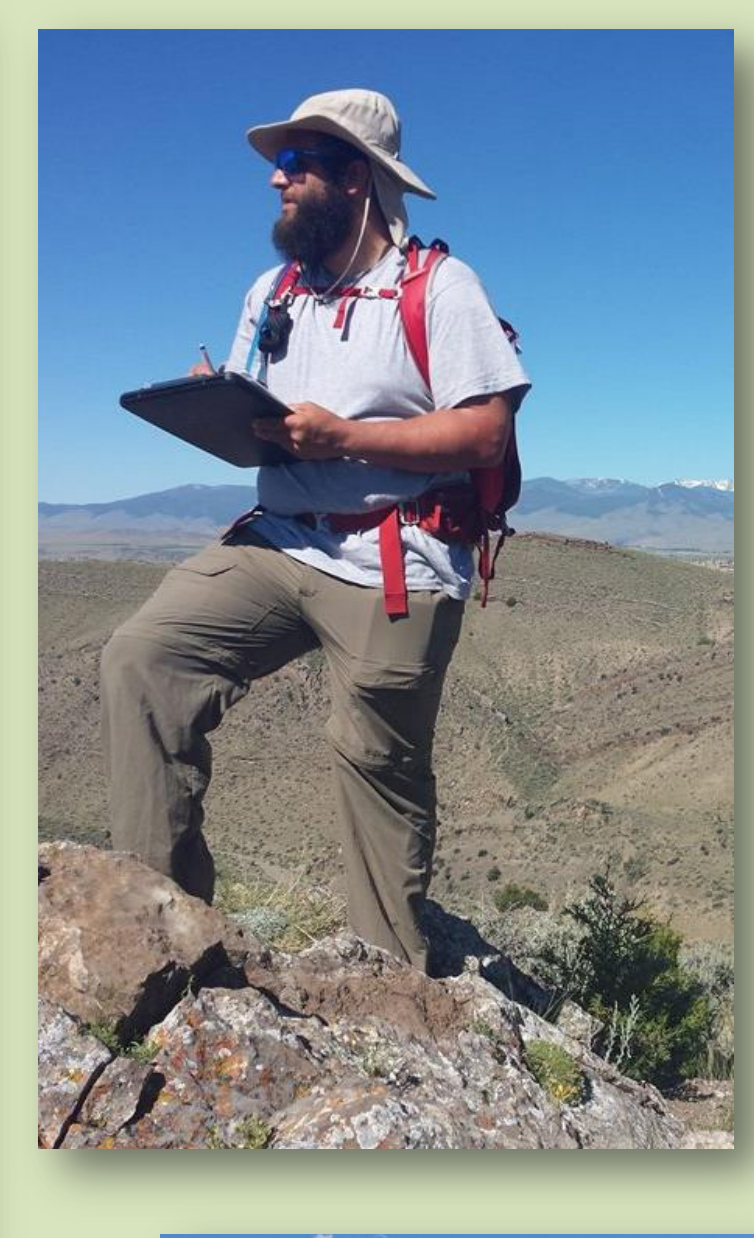



The Montana and Wyoming experience


- Geology is mostly sedimentary, with interesting structure.
- Classic, well-studied locations with fairly obvious exposures.
- Simple reconnaissance mapping with Brunton, compass and topographic maps to delineate formations. Students produce maps, measured stratigraphic sections, and 2-dimensional cross-sections.





Block Mountain

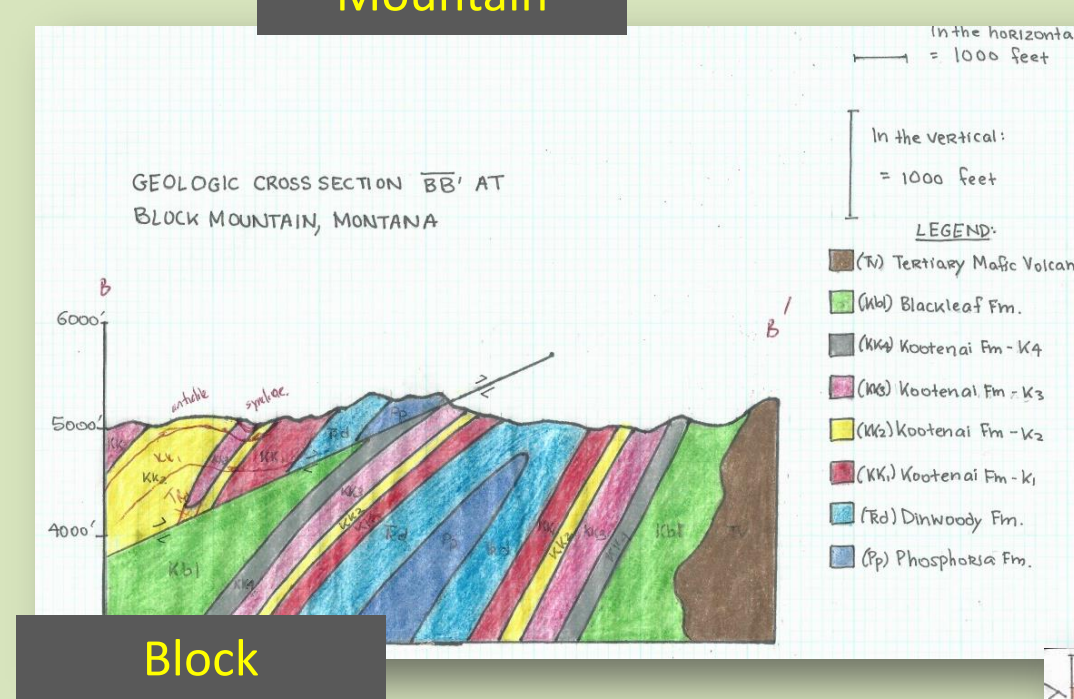




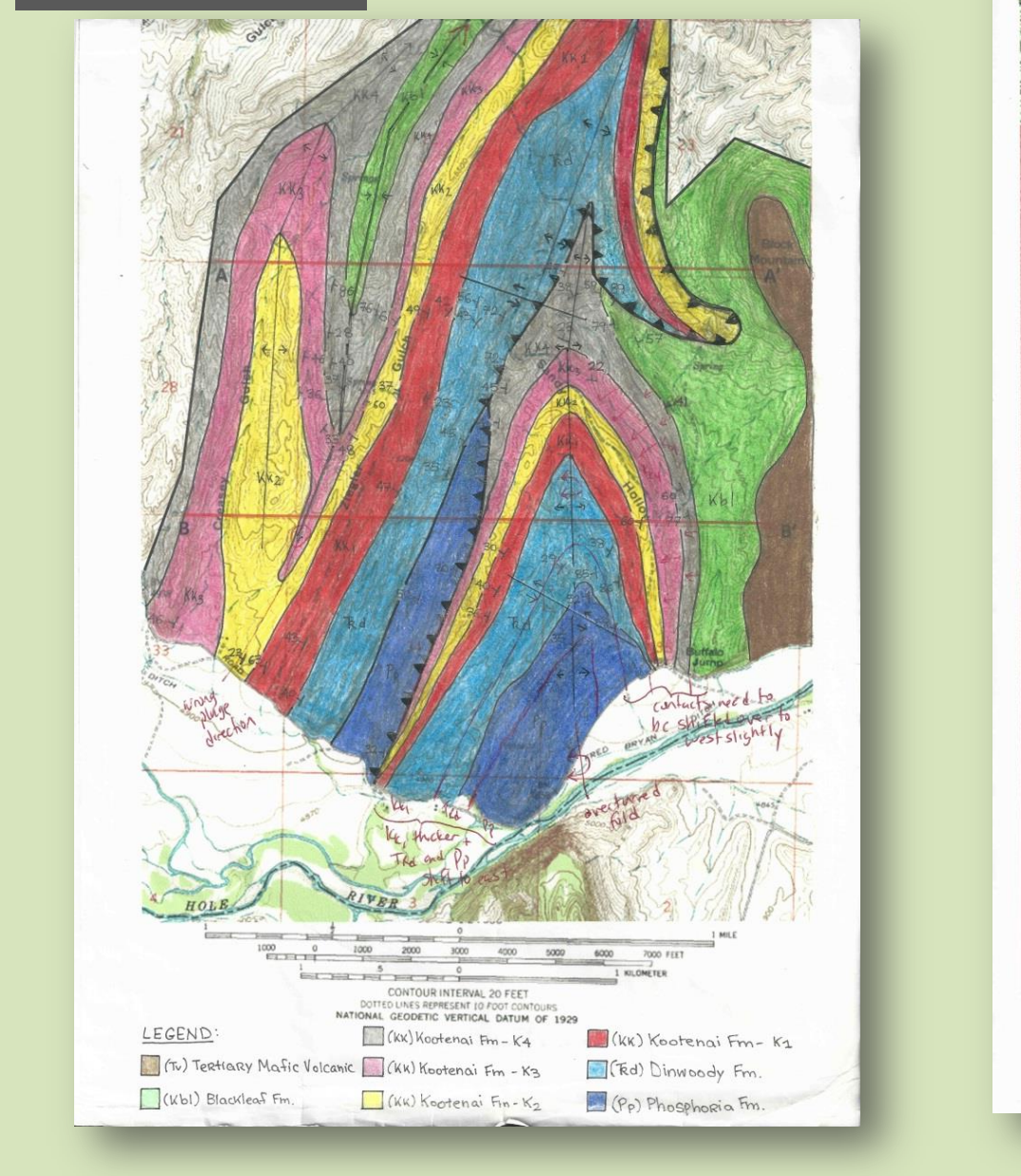








Block Mountain



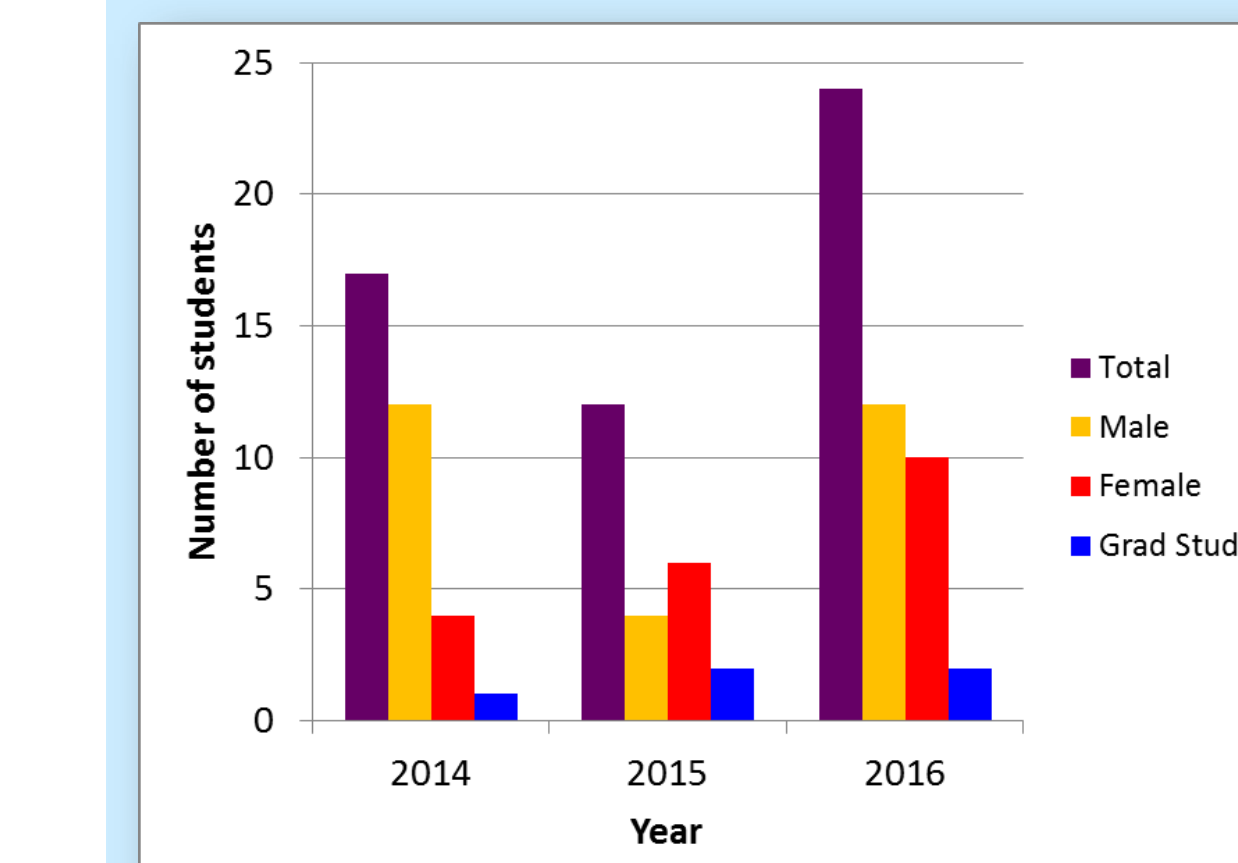
Clarks Fork

Successes and not quite successes:

- ❖ Study areas <1 hour from base camp preferred.
- ❖ Overestimate amount of area the students can efficiently cover
- ❖ Low relief areas are easier to manage for students. Avoid "death marches".
- ❖ YBRA an excellent base, we are the first camp group of the season, less crowded/busy.

MSU Field Geology people

- Team taught:
- Drs. Josh Galster, Tanya Blacic, and Greg Pope (w/ a TA) at NJSOC
 - Dr. Matt Gorrington (w/a TAs) in Montana & Wyoming




- Enrollment:
- So far, student enrollment is variable per year.
 - Has tended to show a more even male/female ratio in last 2 years
 - Dominantly undergraduate, though a few grad students take as well.

EAES 404 Field Geology format

- 6 semester credits. Fees ~\$4100 include tuition and special fees, van transportation, food and lodging, but not air fare to Billings.
- Prerequisites: Stratigraphy, Petrology, Structural Geology.
- Usually, ~40 days mid-May to late June.
- 10 days in residence at the New Jersey School of Conservation in Stokes State Forest, NJ. Focus on surficial geology, use of surveying and field geophysical instruments, sites very near NJSOC campus.
- Travel over Memorial Day weekend to Billings, MT, then to first base camp @ Yellowstone Bighorn Research Association, Red Lodge, MT (have previously used Northwest College, Powell, WY).
- Field mapping (Bruntons with topographic and Google Earth reference maps) in classic exposures in and around the Bighorn Basin.
- Hiking and camping excursion to Grand Teton National Park and Yellowstone National Park (~4 days).
- Second base camp at University of Montana-Western. Field mapping (Bruntons with topographic and Google Earth reference maps) in classic exposures near Dillon, MT.



NJSOC and Montclair State Univ. in northern NJ



Western destinations

ACKNOWLEDGEMENTS:

- Montclair State University: College of Science and Math, New Jersey School of Conservation, and Summer Programs
- New Jersey Division of Parks and Forestry
- Yellowstone Bighorn Research Association
- University of Montana - Western
- Northwest College
- National Park Service
- US Forest Service
- TAs David Sharpe, Halley Rosado, Mitchell Clay
- All the students!