

## Can Field Camps Survive?

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The geology curriculum has long consisted of a common core of classes: physical and historical geology, mineralogy and petrology, sedimentology and stratigraphy, structural geology, paleontology, and field camp. While numerous variations on this basic structure exist, most departments require completion of these courses as part of the traditional geology degree. This once solid core is undergoing significant modification at campuses across the country. The demands of service teaching have required greater flexibility in the pathways to our discipline. In addition to physical geology, introductory courses in oceanography, planetary geology, and environmental geology are now serving as starting points for students perusing a degree in geology. While the benefits and drawbacks of such a policy are worthy of discussion, even greater changes are occurring within the senior-level curriculum. The role of field camp as the capstone course of the undergraduate experience is fast fading in importance.

The combination of several factors over the last fifteen years has diminished, in the minds of some, the significance of the traditional geology field-mapping course. First, the decline of the American mining industry coupled with a reduction in the intensity of petroleum exploration has reduced the demand for highly skilled field mappers. Second, the continuing transition from observational to experimental and theoretical research has changed the academic skill-set needed by those students heading to graduate school. As geology majors increasingly include courses in physical chemistry and differential equations to their plan of study, ever fewer are participating in traditional field camps. Finally, declining numbers of geology majors nationally has led to many schools eliminating or consolidating their field camp programs. In some cases, increasing capital and transportation costs overwhelm the academic benefits of maintaining a field camp program. As such, departments modify their curriculum to make optional a course they can no longer support. In the face of these changes, is there a place for field camp in the future of geoscience education?

The experiences of field camp linger long in the memories of all of us; whether we thrived upon the hardships of field work or merely survived them. In the educational tradition of geology, field camp has served as a rite of passage – a complex combination of basic training, fraternity initiation, and baptism by fire. In the face of a changing educational landscape will field camp play a meaningful role?

Several important considerations lead me to believe that field camp plays an important – even essential – role in geoscience education. Field studies present the student with a hands-on learning experience. Removed from the simplifications and abstractions of the

classroom the student is forced to confront the complexity of nature. Likewise, field projects demand the acquisition and interpretation of data. Such exercises illustrate to the student the importance of detail as well as the problems scientists experience due to limitations in the quantity and quality of data. Students are required to arrive at well-founded interpretation based upon incomplete data with limited time for analysis. Thus, field-based exercises provide students with a very real taste of the nature of their chosen profession. Of equal importance is the experience in team building and collaboration provided by partnering on field projects. With increasing emphasis on collaborative and interdisciplinary research within the geosciences, students skilled in team-based learning will be increasingly sought after by the best research programs.

Yet, do these educational benefits supersede the costs and limitations of traditional field camps? Clearly, in some cases, university decision-makers have answered in the negative. The time has come for the field camp curriculum to evolve to meet the demands of our discipline's future. Towards this end, two options present themselves: transition from traditional field mapping to geotechnical application-based experiences or fusion of modern technology into the traditional mapping project. Neither of these options is easy, nor will they prove to be inexpensive. Additionally, either transition would likely require a significant change in the personnel teaching and administering traditional field camp programs. Yet, if field camp is to be relevant to our students, it must change in pace with our changing discipline. There exist a number of outstanding geotechnical and environmental field camp programs across the country, any of which could serve as a model for the redesign of a field camp program. There is, however, an important place for the field mapping of geologic structures in the geoscience curriculum. In those cases where such a traditional course will be maintained, it is essential that students be provided with opportunities to apply modern technology to their projects. Electronic total stations, differential GPS units, high-resolution aerial photography, digital elevation maps, as well as the associated imaging and analysis software must become an integral part of the modern field camp experience. There will always be a place for a Brunton compass and a clipboard, yet to deny the role of technology in field-based education will surely doom traditional field camps to a position from which they will not recover – academic irrelevancy.

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