

Title:

Geology Field Camp at Southern Illinois University: Six weeks exploring four tectonic regimes

Authors:

Friedman, S. A.; Conder, J. A.; Ferre, E. C.; Heij, G.

Affiliation:

AA(Geology, Southern Illinois University, Carbondale, IL, USA; safriedman@siu.edu), AB(Geology, Southern Illinois University, Carbondale, IL, USA; conder@geo.siu.edu), AC(Geology, Southern Illinois University, Carbondale, IL, USA; eferre@geo.siu.edu), AD(Geology, Southern Illinois University, Carbondale, IL, USA; gheij@siu.edu)

Publication:

American Geophysical Union, Fall Meeting 2013, abstract id. ED11A-0718

Publication Date:

12/2013

Origin:

AGU

Keywords:

0815 EDUCATION Informal education, 3643 MINERALOGY AND PETROLOGY Layered magma chambers, 3690 MINERALOGY AND PETROLOGY Field relationships, 8102 TECTONOPHYSICS Continental contractional orogenic belts and inversion tectonics

Bibliographic Code:

2013AGUFMED11A0718F

Abstract

Field Geology is typically the capstone course for an undergraduate Bachelor of Science degree in Geology. This type of course brings together the varied sub-disciplines and course topics students encounter in their undergraduate experience, and puts these in context of active Earth processes. At the same time, a significant fraction of Geology departments have dropped field geology from their offerings and students must choose from those programs still offering the course. Southern Illinois University has offered field geology for over 40 years, stationed in and around southwestern Montana. This field camp offers experiences with four distinct tectonic settings: thick-skin contractional, thin-skin contractional, extensional, and anorogenic. The most challenging projects of the course involve mapping and interpreting Laramide and Sevier compressionaly deformed areas. The major difference between the two types of deformation is that Laramide ('thick-skinned') tectonics encompasses the mid-crust in deformation while Sevier ('thin-skinned') deformation is limited to the uppermost portion of the crust. This difference results in markedly different fold styles and other deformational structures encountered, requiring different approaches to understanding and constructing the deformational histories of the

regions. Extensional tectonics are explored with a paleoseismology project at Hebgen Lake, in Grand Teton National Park where the students typically spend two days, and at the Bitterroot Shear Zone - the edge of a metamorphic core complex along the eastern boundary of the Idaho batholith. While recent work from EarthScope and elsewhere casts doubt on Yellowstone as a mantle plume, Yellowstone remains the classic example of a continental hotspot. During visits through the park, students distinguish between the recent volcanics and hydrothermal activity of Yellowstone and the nearby Eocene Absaroka volcanics. Expanding on the story of the Yellowstone hotspot, a visit is made to Craters of the Moon National Monument in the Snake River Plain to examine some of the youngest volcanics in North America. Not only does field camp give students an occasion to put their knowledge-base developed during their undergraduate years into action, but it is also an ideal opportunity to expose students to the varied approaches applicable to distinct tectonic problems and situations. At SIU, we are proud to offer a wide range of experiences drawing from several important tectonic provinces giving students a strong foundation for their future geological careers and continuing scientific development.