BOISE STATE UNIVERSITY

Field Geology Course (Geology summer field camp)

Overview

Geology Field Camp is the capstone experience in many undergraduate Geology programs, and it integrates and applies material learned in almost all of the undergraduate core classes in geoscience. Field camp is usually taken in the summer following the Junior or Senior year, after completion of the required background classes in geology. The philosophy of the course – and the challenge given to student participants – is simple: Now that you have taken a lot of classes and have a strong foundation in geology, combine all of your accumulated knowledge and skills to investigate and interpret the geology of an unknown area based on your own observations. A typical exercise for field camp takes 3 or 4 days to complete and centers around making a detailed geologic map and cross section, accurately recording observations in a field notebook, and writing a summary report interpreting the geologic history and significance of the area. The class consists of several such exercises, with generally increasing level of complexity.

The field class at Boise State offers additional valuable experiences for students: international travel, exposure to other cultures, and a broadening of their scientific worldview. We strongly encourage students to take full advantage of their trip to Europe, and the majority of students make plans for additional travel (individually or in groups) to surrounding areas after the field camp is concluded.

Geology of Sardinia

The island of Sardinia is approximately 275 km in size and offers an amazing variety of geology in a relatively small area. Because of the geologic diversity, quality of exposure, and favorable climate, it is an excellent location for Geology summer field camp.

In particular, Sardinia contains a fantastic geologic record of the Variscan Orogen, a collisional system of late Devonian to Mississippian age, which was responsible for much of the initial assembly of continental crust in southern Europe. Field projects for the class have been chosen to give students an opportunity to see, map, and analyze the geology of various parts of a collisional mountain belt, including:

1) *Internal zone* – plutonic and high-grade metamorphic rocks
2) *Nappe zone* – thrust imbricated allochthonous nappes
3) *External zone* - foreland fold-thrust belt
4) *Post-orogenic extensional basins* and sedimentary cover

Individual multi-day projects contain field relationships to be mapped, analyzed, and interpreted within the context of each area, and they integrate collectively into a comprehensive picture of the Variscan collisional system as a whole.

Preparation for the Field Class

Students should have completed the majority of the course work needed for a Bachelor of Science degree in Geology. Below are some of the recommended subjects that should have been covered by a student's course work prior to arrival at field camp, as well as some other classes that would provide useful background.

Recommended Prerequisite subjects

Stratigraphy/Sedimentation
Structural Geology
Mineralogy/Petrology

Other Useful Background Subjects:

Introductory Field Geology
Geomorphology
Paleontology
Plate Tectonics

Syllabus

The field class begins with three, one-day introductory mapping exercises: one in relatively simple bedded limestones, another in phyllites with mesoscopic folds and cleavage, and a third in continental red beds (fluvial sandstones, shales, and conglomerates). The goal of these exercises is to review basic mapping skills like accurate location on a topographic map, drawing contacts and map symbols, making detailed rock descriptions, and the use of a compass and inclinometer to collect planar and linear orientation data (bedding, cleavage, fold hinge and axial surface orientations, etc.). These exercises also give the faculty and teaching assistants an opportunity to gauge the initial knowledge and skill level of students in the class so our teaching and interactions can be adjusted to address individual needs.

Introductory Exercise 1:
Military Hills limestones

Field map and notebook collected and reviewed at the end of the day

Introductory Exercise 2:
Argentiera phyllite

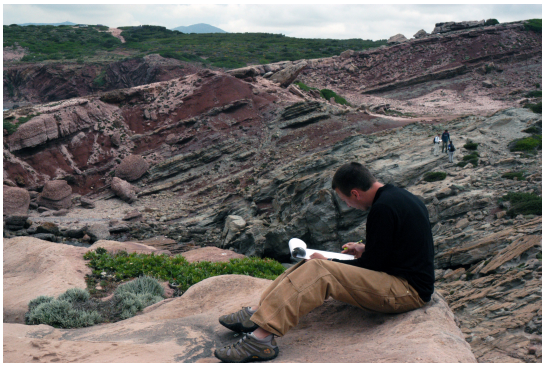
Field map, notebook, and stereonet analysis of orientation data reviewed in the evening.

Introductory Exercise 3:
Cala Viola stratigraphic column and rock descriptions

Field notebook and stratigraphic column reviewed in the evening.

Following the introductory exercises, students complete a series of multi-day mapping projects designed to progressively challenge and develop their field skills.

Project 1 – Cala Viola area
Students work in pairs to map Permian and Triassic continental sedimentary rocks deposited in a post-Variscan, intermontane basin. They individually create a geologic map and write a report describing observations and interpreting the geologic history of the study area.



Assignment Due:
- 1:5000 scale map of field area
- cross section
- stereographic projection analysis of orientation data
- geologic report

Mapping Project 2 – Gennargentu area
Students work in pairs to map Mesozoic cover unconformably overlying deformed Variscan basement rocks of the nappe zone. They individually write a report describing observations and interpreting the geologic history of the study area.

Assignment Due:
- 1:5000 scale map of field area
- cross section
- stereographic projection analysis of orientation data
- geologic report

Mapping Project 3 – Flumendosa area
Students work in large mapping teams (6-8 people). Each team must self-organize to map a relatively large area in the Variscan nappe zone. The project requires them to work collaboratively and to integrate their results. They write a single collective report describing observations and interpreting the geologic history of the study area. Members of each team receive the same grade for the project.

Assignment Due: Group Project
- 1:10,000 scale map of field area
- cross section(s)
- stereographic projection analysis of orientation data
- geologic report

Mapping Project 4 – Nebida area
Students work INDIVIDUALLY to map part of the Variscan external foreland zone and write a report describing observations and interpreting the geologic history of the study area. This report should also have a section linking observations from all field projects and discussing the evolution of the Variscan orogenic system as a whole.

Assignment Due:
- 1:5000 scale map of field area
- cross section
- geologic report