

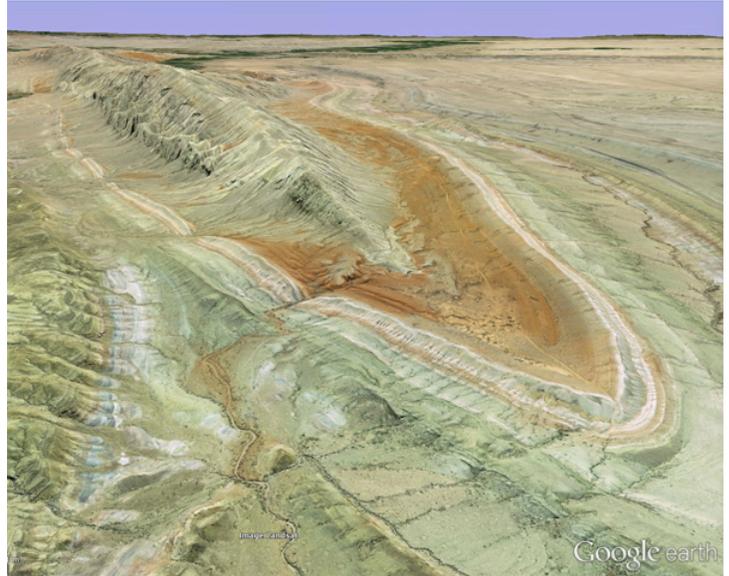
Fold Analysis Challenge¹

Sheep Mountain, Wyoming

Information for instructors using the FAC activity for Google Earth desktop

Purpose of the Fold Analysis Challenge

The Fold Analysis Challenge (FAC) uses Google Earth and a customized Google Earth interface to help students visualize the orientations of eroded dipping sedimentary layers and to visualize the geometries of folds in layered rocks. The FAC uses spectacularly exposed layers at Sheep Mountain, Wyoming and takes students through a variety of activities to help them visualize the shape and orientation of the fold structure responsible for the patterns that can be seen in Google Earth at Sheep Mountain. After working with Sheep Mountain, students apply what they have learned to interpret other fold structures in the Bighorn Basin. Once students have become adept at visualizing dipping layers and folds, they are ready to use the same strategies for visualizing fold structures anywhere in the world where they are well exposed in Google Earth.



Platform

The FAC student activity supported by this document for instructors is written specifically for the Google Earth desktop interface. The Fold Analysis Challenge interface is also available as an online version for web browsers that still support the Google Earth plugin and Application Program Interface (API), currently Safari or Firefox but not Chrome or Internet Explorer. The FAC activity would need to be modified to be used with the online API interface.

The desktop version of the FAC student activity requires installation of Google Earth or Google Earth Pro on a desktop or laptop computer. Google Earth for mobile devices is not adequate. Instructions for installation and set-up of Google Earth are detailed in the student handout.

Assumed background

The FAC activity assumes that students are familiar with basic concepts of stratigraphy, fold classification and terminology, strike and dip, simple geologic maps and cross sections, and stereographic projections.

Target audience

The primary target audience for this activity is undergraduate geoscience majors and geology or geophysics graduate students who come from non-geology undergraduate programs. The activity is

¹ Version 1.0 by Declan De Paor, Mladen Dordevic, Paul Karabinos, Barb Tewksbury, and Steven Whitmeyer. Spring 2016. Contact ddepaor@odu.edu

particularly appropriate for a structural geology course. The activity can certainly be adapted for use in an intro geology course, but the activity would require modification if students are not familiar with terminology from the assumed background described above. The sections on stereographic projection could be omitted entirely for such a course.

Class, lab, or homework?

The activity could easily be used for any of the above. Using the activity in a class or lab setting where an instructor is present provides the opportunity to help students when they get stuck, to check to make sure they are not wrong-headed before proceeding, and to stop the class periodically to consolidate what students have done before going on to the next step.

Work in groups or individually? Being the “pilot in command” of the mouse is critical for students to visualize well in Google Earth. Watching someone else zoom, tilt, and pan is not nearly as effective as being in charge of the controls. Having a computer for each student in the class will produce better results than having 2 or 3 students sitting around a computer screen with only one of the students actually controlling the mouse. Group work is still valuable, but pairs or trios of students working on their own computers and then discussing what they are seeing is the best set-up.

Student preparation for class. A surprising number of students have not used Google Earth, particularly in 3D “fly-through” mode. To save time during class, give students an assignment ahead of time to practice navigation in Google Earth. If you plan to have students use their own computers, have them install and configure Google Earth ahead of time as well. Instructions for doing so are included in the FAC activity.

Feedback

We want to keep improving this educational resource. Please let us know how it works out in your classroom. Contact Declan at ddepaor@odu.edu. Thanks!