

Name: _____

Lab 7. Understanding Geologic Maps

In this activity you will generate models of rock layers that have been deformed by geologic forces and then eroded to a flat plane. The patterns of the “rock layers” exposed at the surface by “erosion” provide clues to their shapes.

Making the model

Materials

Modeling compound (at least three colors), cafeteria tray, length of dental floss

Procedure

Press the modeling compound into several flat, thin sheets.

Stack the sheets to make a single slab composed of several contrasting-colored layers.

Deform your slab to model a particular geologic structure as directed by your instructor.

Fill in the bottom of your model with additional modeling compound so that it lies flat on the tray.

Place your model right-side-up on the table.

Hold the dental floss taut and level. Use it to make a horizontal cut through your model. Try to choose a level that will cut through layers of many colors. Make an additional cut through your model, this time along a vertical plane.

Remove the top slice of your model. Place it cut-side-down on your cafeteria tray next to the base of the model.

The exposed surface of the bottom of your model represents the “remnant” surface left behind after the overlying rocks are worn down by erosion. This is the surface and pattern geologists find when mapping surface exposures of bedrock. The removed top surface allows you to see the entire deformed structure, without erosion. This is a view denied us in real geology. The vertical cut allows us to see exactly what vertical movement has occurred. Again, this is seldom visible in the field, but geologists certainly try to infer what a cross section would look like.

Viewing the models

Examine each model made in class. Make certain you understand how the layers were deformed to create the final form of the model. View both the “erosional surface” (surface exposed by the horizontal cut) and the cross section (surface exposed by the vertical cut). Make a color sketch of the two views of each model.

Dome

Basin

Dip

Monocline (step) across a dip

Plunging syncline

Plunging anticline

Accordion fold

Dip-slip fault across a dip