

Exploration 3: Running Water — Stream Dynamics

Lawn Lake, Roaring River, and Fall River, Rocky Mountain National Park, Colorado

Log on to the *Encounter Earth* site – <http://www.mygeoscience.com/kluge> – and click the link for the “Exploration 3: Running Water—Stream Dynamics” KMZ file to begin this activity.

The Lawn Lake Flood

Open the “Lawn Lake Flood” folder and double click the “?” icon next to the Lawn Lake Flood placemark to fly to it. Open the placemark balloon and read about the cause of the flood.

1. Double click the icon for placemark A.

a. Using data from the Status Bar at the bottom of the display, calculate the change in elevation between placemarks A and B. Record your answer in meters.

Elevation of placemark A = _____ m

Elevation of placemark B = _____ m

Change in elevation between placemarks A and B = _____ m

b. Use the Ruler tool to measure the length of the channel of the river between placemarks A and B. Do not measure the straight line path—use the path tool instead. Record your answer in km.

Length of the river channel = _____ km

c. Calculate the gradient of the stream channel between placemarks A and B by dividing the change in elevation by the length of the channel.

Gradient of stream channel between placemarks A and B = _____

2. Double click the icon for placemark B to zoom back in for a closer view.

a. Repeat the steps used above to calculate the gradient of the valley floor between placemarks B and C.

Elevation of placemark B = _____ m

Elevation of placemark C = _____ m

Change in elevation between placemarks B and C = _____ m

Gradient of stream channel between placemarks A and B = _____

b. Double click the icon for placemark D in the Places panel. Use the Ruler tool to determine the size of the largest boulders in this field of view.

c. Double click the icon for placemark C in the Places panel, and compare the size of the sediments at placemark C with those at placemark B.

d. Describe how the sudden change in gradient at location B was responsible for the rapid deposition of the alluvial fan here, and why the sediments are smaller and finer at placemark C.

3. Double click the icon for placemark E in the Places panel.

a. Cite whatever evidence you can to support the argument that sediments at placemark C were deposited before those at placemark E.

b. Describe the effects of the current deposition at placemark E on Fall River, which flows into this area from the west. (You can double click the Fall River icon in the Places panel for a wider view.)

4. Double click the icon for the Meander Map Area in the Places panel. Set the elevation display in the Status Bar to “Feet, Miles” by clicking Tools > Options > 3D View tab.

a. Figure 3.1 is a map of a section of the Fall River corresponding to the Meander Map Area shape in the Places panel. Draw in the point bars and label the cut banks on the meanders on Figure 3.1. Describe where in the meanders each occurs, and explain how and why they form where they do.

b. Follow the procedure followed in step 2 above to determine the following gradients (note that the unit of your gradients will be feet/mile):

Gradient along the stream channel from placemark F to placemark G = _____

Work:

Straight line gradient from placemark F to placemark G = _____

Work:

c. Imagine that during a period of peak flow, the river briefly breaches its banks, and a small channel is cut directly across the land between placemarks F and G. Consider the answers you provided in 4b, and describe and explain the processes by which the meander between placemarks F and G could be cut off from the main flow of the river.

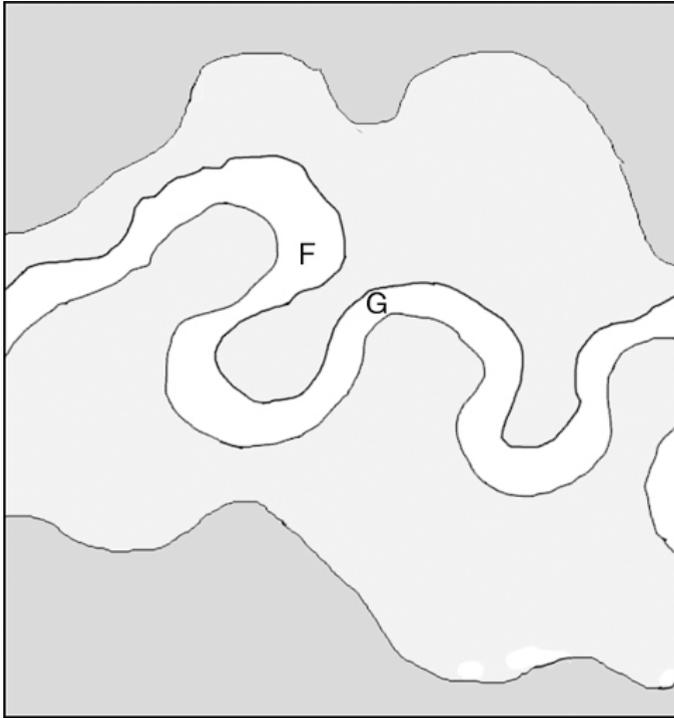


Figure 3.1

