

Name _____ Class _____ Date _____

Human Impact on Erosion – Providence Canyon, Page 46, Class Work

Providence Canyon State Park provides a spectacular example of erosion and environmental change over the last 200 years. The park contains a series of canyons and gullies as much as 200 feet (66 m) deep, formed by human induced erosion. The park is located in Stewart County, in southwestern Georgia, near Lumpkin.

Providence Canyon is sometimes called Georgia's "Little Grand Canyon". It is one of the Seven Natural Wonders of Georgia. It differs from the Grand Canyon in Arizona, however, because Providence Canyon cuts through soft, unconsolidated sediments, rather than hard rock. The Grand Canyon in Arizona formed over a much longer time from much older hard rock, including granite and gneiss.

The canyon is actually a relatively recent feature. It did not exist when the first settlers arrived in the early 1800's. Providence Canyon began to form because of poor farming practices, which led to runaway soil erosion. After the trees were cut down and the land was cleared for agriculture in the early 1800's, farmers plowed straight up and down the hills. The furrows provided a good path for rainwater to run, causing erosion.

Between 1820 and 1930, erosion removed about 8 inches of soil and sediments per year. By 1850, gullies ranging from 3 to 5 feet deep (1 to 2 meters) had formed in the fields. Once gullies appeared, erosion rates increased, and the land became useless for farming. Gullies deepened and widened into canyons. In the 1930's, the Civilian Conservation Corps planted trees in the Providence Canyon area to try to stop the erosion.

Erosion at the head of each canyon caused the canyons to lengthen. Rates of headward erosion were measured from aerial photos taken over the years. Between 1955 and 1968, the canyons lengthened by about 6 feet (2 m) per year.

Providence Canyon became a State Park in 1971.

Providence Canyon is a perfect example of erosion as a result of human impact on the land, and the need for sound soil conservation practices. The softness of the sediments in this area, and poor farming practices led to the severe erosion that formed Providence Canyon.

Activities:

Answer the following questions in your lab book.

1. Locate Providence Canyon on a map of Georgia. Trace Georgia into your composition book and label providence canyon.
2. Find photos of Providence Canyon online. See Resources.
3. Between 1820 and 1930, erosion removed about 8 inches of soil and sediments per year. If erosion began in 1820, calculate how deep the canyon was in 1930.

_____ cm
_____ m

4. If the canyon is currently about 200 ft (66 m) deep, find the erosion rate since 1930.

Increase in depth since 1930 _____ m

Number of years since 1930 _____ yrs

Divide depth in meters by years to get erosion rate in meters per year

_____ m/yr

5. Has the erosion rate increased or decreased since 1930?

6. Graph the erosion at Providence Canyon (gully or canyon depth) from 1800 to present. (See sample graph, below.)

7. Predict how deep Providence Canyon will be in 2050.

8. Draw a timeline of events at Providence Canyon from 1800 to the present. Include these items on your timeline:

- The area was covered by forest
- Forests were cut down
- Farming began
- Gullies began to form
- Gullies were 1-3 m deep
- Gullies are about 75 m deep
- Gully depth you calculated above for 1930
- Trees were planted to try to slow erosion
- The area became a State Park

9. What caused the erosion to begin in the Providence Canyon area?

10. Compare the modern color photos with photos from 1937 at the Library of Congress website. What differences do you notice about the land?

11. Research farming practices that have been implemented in order to conserve soil since the early 1800's.

12. What does kudzu have to do with controlling erosion? When was it introduced to the south and why?

13. Suggest ways in which you could help prevent soil erosion.