



Photos: Kansas Biological Survey

Above: A researcher points out the difference in elevation between formerly plowed land, foreground, and unplowed adjacent native prairie, background, at this site. Inset (left): Scientists dig a pit to examine differences in soil layers; (right) darker, richer soils are visible in the top layer, called the "A" horizon.

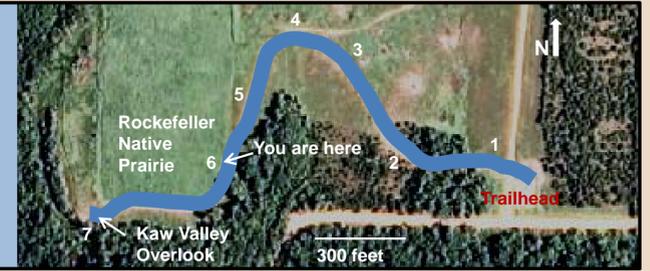
**From here, you see topographical evidence** of the agricultural history of this landscape. The land rises abruptly to the west by as much as three feet along a relatively straight north-south line. This elevational difference reflects the influence of agricultural practices of the Euro-American settlers who moved to this area in the mid-19<sup>th</sup> century. Native prairie was plowed for conversion to row-crop agriculture, replacing the prairie's perennial vegetation with crops present for only part of the year.

This practice induced significant erosion, which was especially acute during the droughts of the 1930s. The amount of material lost via erosion is directly reflected in the rise in elevation here. The land west of this line was never subjected to plowing. The land east of the line was plowed repeatedly for decades, and the loss of topsoil is obvious.

**Remember: Sound agricultural practices are required to prevent erosion of topsoil that takes decades or centuries to recover.**

### Rockefeller Prairie Trail stations

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### Where did the eroded topsoil go?

In the 1930s, wind-eroded topsoil from Midwest farms, especially those in the drier climate west of here, was transported eastward. Dust clouds were visible as far east as Washington, D.C., and this helped prompt Congress to create the Soil Conservation Service, now known as the Natural Resources Conservation Service. Water-eroded topsoil was washed into streams and rivers and eventually transported downstream.

After row-crop agriculture ceased, the eroded land slowly began to recover. At this site, the land east of the line of plowing is reforming a topsoil layer from the vegetation planted there in 1957. It likely will take decades to centuries of uninterrupted productivity to regenerate topsoil as rich in organic matter as the soil that eroded.



Colorado State University Special Collections

Deep prairie soils eventually eroded after years of continuous tilling.

### The effect of plowing on Earth's atmosphere

The influence of settlers' agricultural practices in this region are evident in another, less obvious way. Records of Earth's atmospheric composition show an increase in carbon dioxide just prior to the Industrial Revolution. This increase represents the carbon dioxide that is released when organic-rich soils, such as those found in prairies, are disturbed.

Settlement in the Midwest led to the plowing of so much land that we can see the resulting carbon dioxide in the atmospheric record. Though the burning of fossil fuel throughout the Industrial Age has far eclipsed the plowing-induced carbon dioxide increases evident in the mid-19<sup>th</sup> century, the increase in carbon dioxide due to plowing is an important reminder of human influence on the Earth.