Second Field Trip

ES546A Field Geomorphology

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Stop 1 - Cottonwood Falls

At Cottonwood Falls, we walked to the bridge and discussed the history of the dam and the changes in morphology caused by the change of base level as a result of dams. We observed damage to the concrete dam caused by the river trying to cut headward through the dam.

Figure 1. The Cottonwood Falls dam. Image by Ryan Clary.

Stop 2 - Outcrop ~4.75 miles west of Cottonwood Falls on Lake Road.

We did not exit the vehicle at this site, a fault was mentioned but not discussed in detail.

Figure 2. Outcrop in the vicinity of 38.36972°, -96.62594° looking north. Image via Google Earth.

Stop 3 - KS-150 road cut

We did not exit the vehicle at this location. Here we discussed the potential of the red and green tinted shale being paleosols and the resistance of limestone strata to weathering and erosion.

Figure 3. Roadcut along KS-150, in the vicinity of 38.36272°, -96.69225° facing north. Image via Google Earth.

Stop 4 - Marion Lake outlet

At Marion Lake outlet we again discussed landscape changes caused by change of base level caused by artificial dams. The terrain is very muted downstream of the reservoir due to the base level being near the surface and the stream flow being highly controlled. Water was not being released into the stream except through leakage due to low precipitation this year. On the drive to the outlet we also discussed the monitoring wells present at the dam to monitor subsurface water levels on the downstream side of the dam to gauge bypass.

Figure 4. Marion Reservoir flood gates. R.Olsen.

Figure 5. North Cottonwood river outlet from Marion Reservoir. R.Olsen.

Stop 5 - Coronado Heights

Coronado Heights is a structure built out of local Dakota sandstone in a high point with a clear view of the surrounding area. The structure was built in the 1930s. Dakota sandstone is a Cretaceous period sandstone with a dark red-brown color that can be distinguished by the bright green lichens that grow on exposed stone. The Dakota sandstone is rich in manganese and has a gritty texture due to the quartz and feldspar sand that comprises it. While walking the site, several interesting features were found that appear to be formed by laminar flow while the sediment was initially deposited. Pieces of ironstone are also present at the area, both embedded in in-place sandstone and eroded out of the sandstone, loose on the ground.

Also visible from the site is a slump on the next hill to the north. A slump is a mass wasting feature that occurs when unconsolidated or loosely consolidated material moves downslope due to gravity as a mass.

Figure 6. Coronado Height castle built in the 1930s of local Dakota sandstone. R.Olsen.

Figure 7. Thinly bedded layers in Dakota sandstone. R.Olsen.

Figure 8. Possible Liesegang rings in Dakota sandstone, darker areas are likely rich in manganese. The bright green lichens that grow on the Dakota sandstone are easily visible on the upper part of the stone . R.Olsen.

Figure 9. More possible Liesegang rings and prominent lichens on Dakota sandstone. R.Olsen.

Figure 10. Manganese or ironstone nodule embedded in Dakota limestone, this nodule is approximately golf ball size. R.Olsen.

Figure 11. Slump visible from Coronado Height on the next hill to the north. R.Olsen.

Stop 6 - Kanopolis Lake outlet park

The stop at Kanopolis Lake outlet park was short. At this level we discussed more changes in terrain due to changes in base level. Kanopolis Lake is the oldest manmade lake in Kansas.

Figure 12. Smoky Hill River at the Kanopolis Lake outlet. Image by Ryan Clary.

Figure 13. Kanopolis Lake outlet. R. Olsen.

Stop 7 - Mushroom Rock State Park

Mushroom Rock State Park contains concretions of Dakota limestone supported on pillars of a less resistant underlying sandstone that had been eroded away by wind, water, and possibly bison in the distant past. The boulders have visible cross bedding and it is likely that more of the sandstone contractions are present at the site and still buried.

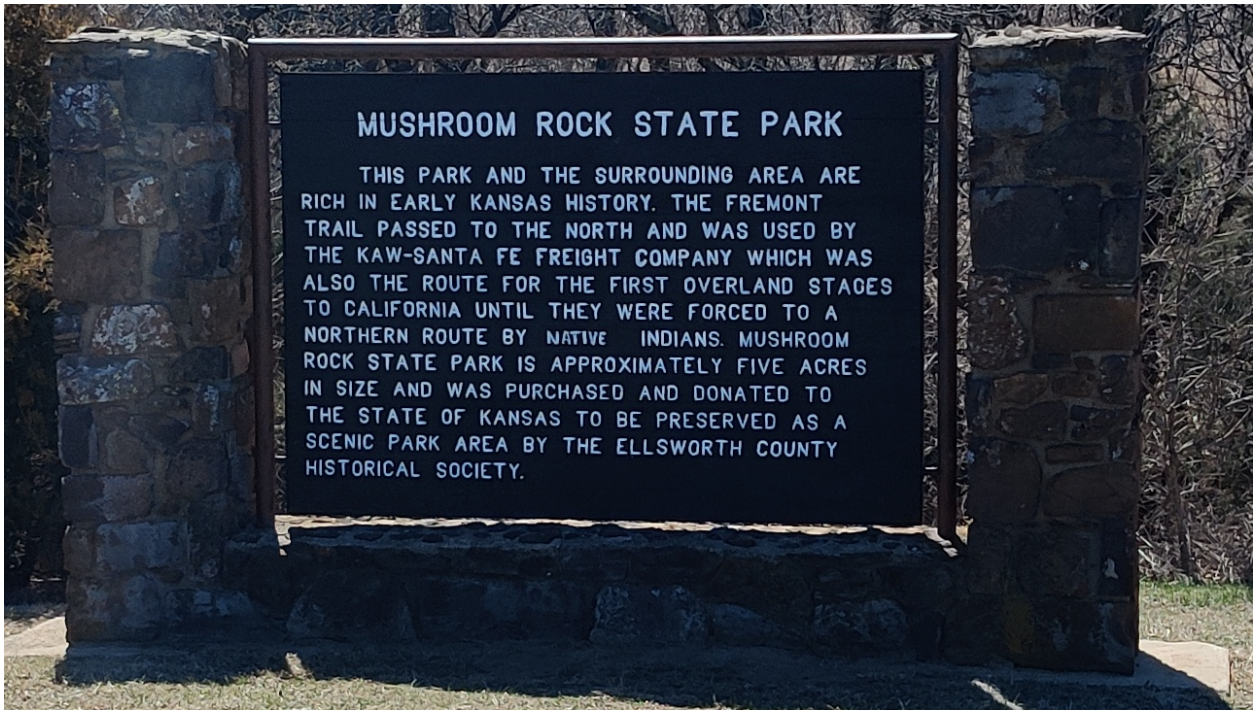

Figure 14. Mushroom Rock State Park sign. R. Olsen.

Figure 15. One of the mushroom rocks present in the park viewed from the east, the bottom of the more resistant stone is approximately 8 to 9 feet from the ground. R. Olsen.

Figure 16. Same feature as Figure 15 view from the south. R. Olsen.

Figure 17. Larger mushroom rock in the south end of the park viewed from the north, the upper stone is approximately 10 to 11 feet off the ground. R. Olsen.

Stop 10 - Kansas Wetlands Education Center at Cheyenne Bottoms

The Wetlands Education Center was an interesting stop. The center contains a small museum style timeline of Cheyenne Bottoms and several interactive displays intended for children. There was also a collection of reptiles, amphibians, and rodents that are native to the area. Due to lack of rainfall in the area, the wetlands were completely dry.

Stop 11 - Sand Hill State Park

Sand Hill State Park is composed of dune sand deposits from the Arkansas River to the south and west. The dunes are no longer mobile and have not been since the 1930's to 1950's and have largely been overgrown and colonized by trees and grasses capable of surviving in sand. One way to date when the last mobilization was would to find the oldest tree and take a core sample to count the rings.

Figure 16 View looking ENE from the top of the sand hill. R. Olsen.

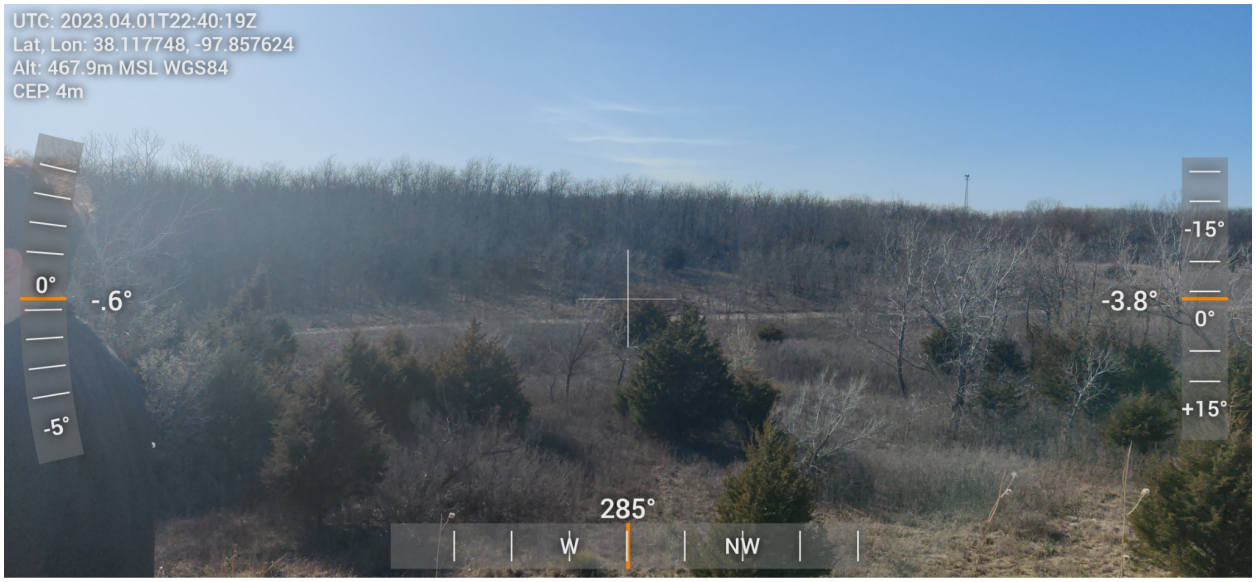

Figure 17. View looking WNW from the top of the sand hill. R. Olsen.

References

http://www.kansastravel.org/coronadoheights.htm
https://ksoutdoors.com/State-Parks/Locations/Mushroom-Rock
http://www.naturalkansas.org/sandhill.htm