

Caprock

Q. Don, what can you tell us about the caprock that starts around Lubbock in West Texas and continues beneath the Great Plains?

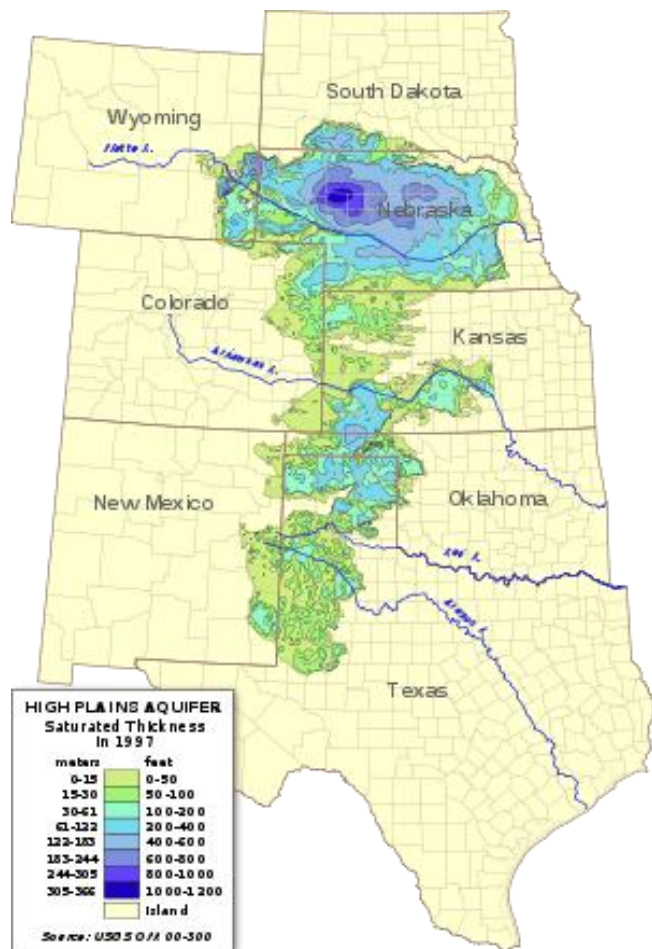
A.

The Cap Rock in Panhandle TX has two meanings; one is the east facing escarpment running North-South through the central Panhandle. The other is the escarpment and the high plateau west of the escarpment. The escarpment could be caused by either a normal fault with the west side being the upthrown side or by erosion working its way from east to west. Actually, it is erosion not a fault.

The high plateau extending west of the escarpment is created by the younger Ogallala rock layer. It was deposited in the last million years as erosional debris was shed eastward off of the southern Rocky Mountains of eastern New Mexico during the four glacial periods when thick mountain glaciers grew on the New Mexico Rocky Mountains. Much like what we see today in coastal Alaska where trains of debris run out of the glaciated mountains into the sea.

Normally the young Ogallala would weather into rolling hills rather than a flat plain. The flat plain exists because the arid climate of the Panhandle causes the top of the ground water to evaporate during the annual dry time which builds up over the years a thick, dense layer of limestone called caliche or hard pan. The caliche is extremely resistant to erosion: resulting in an essentially flat, uneroded top of the young Ogallala.

Below the young Ogallala is another layer of rock called old Ogallala. It is the normal accumulation of erosional material shed off the Southern Rocky Mountains of eastern New Mexico. The old Ogallala is 1 to 6 million years old and contains one of the largest fresh water aquifers in the world. See the map below:



Water from the old Ogallala has been and is still being used to irrigate large areas of the young Ogallala. Unfortunately, the rate of recharge of the old Ogallala does not replace the water being used for irrigation. The state of Texas has created several conservation districts that attempt to extend the useful life of the old Ogallala aquifer; dealing with the water as if it were owned by the State. Last month the Texas Supreme Court ruled that subsurface ground water is owned by the land owner, not the State. This will complicate the conservation efforts. The Court also recommended that ground water be treated like oil and gas resources. If the state legislature makes ground water subject to the same rules as oil and gas, the ownership of ground water will be assigned to the land owner who owns the subsurface oil and gas; not to the owner of the surface rights. I have not idea how many farms in the Panhandle own only the surface, but any who do not also own the subsurface rights will not be able to extract ground water without “paying” the subsurface owner for that water.

East of the Escarpment, rocks more than 150 million years old are weathered into rolling hills suitable for farming.

http://en.wikipedia.org/wiki/Ogallala_Aquifer

<http://ne.water.usgs.gov/ogw/hpwlms/hydsett.html>