

The Geology of the Silver City Area

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Mary E. Dowse is Professor Emeritus of Geology at Western New Mexico University. She retired in May of 2016 after 21 of teaching at Western. She earned her doctorate from West Virginia University in 1980 and then pursued a colorful employment history before devoting herself of teaching.

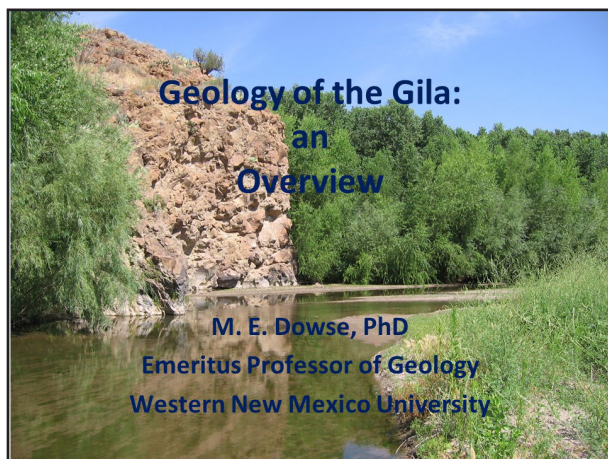


Figure 1. Introduction.

Quick Geologic history of NM

- **First: Assemble a continent**
- **Second: The seas come in and the seas go out**
- **Third: Shape the landscape**

https://geoinfo.nmt.edu/tour/images/NM-oblique_geology.jpg

Figure 2. Quick geological history of NM.

Geologic Map of the Gila Region

- **Assembly**
 - Proterozoic rocks
 - Brown & Grey
- **Rising & Falling seas**
 - Paleozoic & Mesozoic rocks
 - Blue & Green
- **Shape the landscape**
 - Cenozoic
 - Pink & yellow

From: Geologic Map of New Mexico

Figure 3. Geological map of the Gila region.

Assembly of North America

Karlstrom & Bowling, 1990

<http://jan.ucc.nau.edu/~rcb7/ColoPlatPalgeog.html>

Figure 4. Assembly of North America.

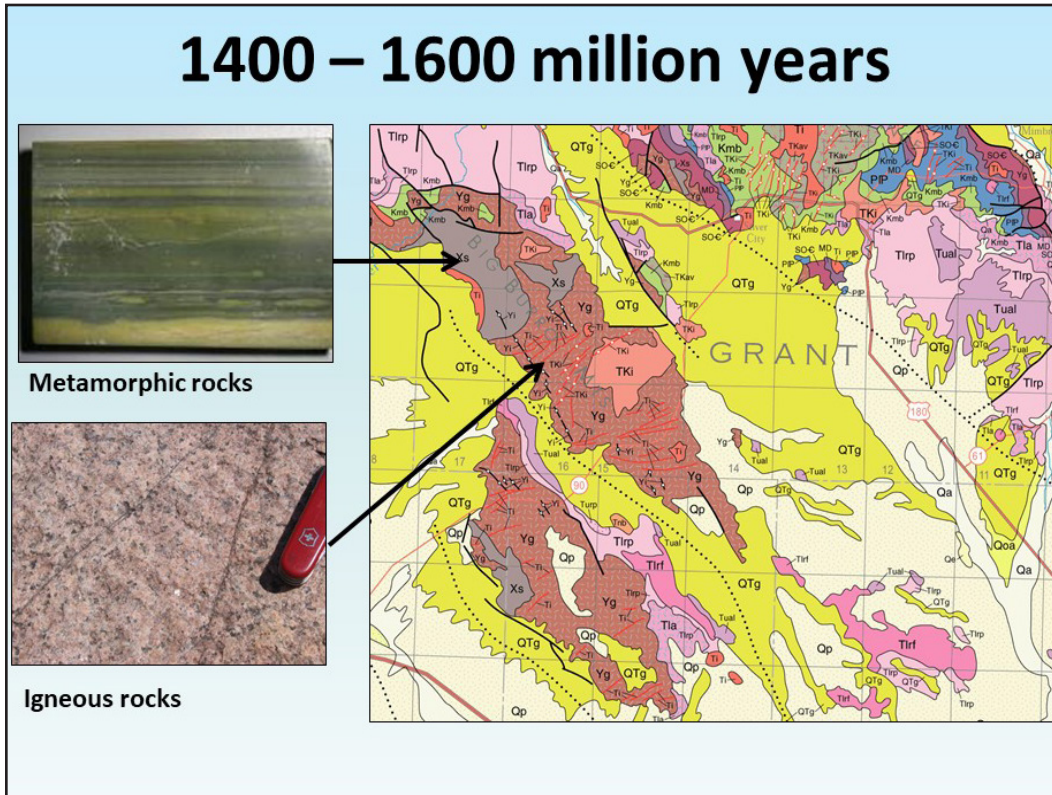


Figure 5. Proterozoic rocks.

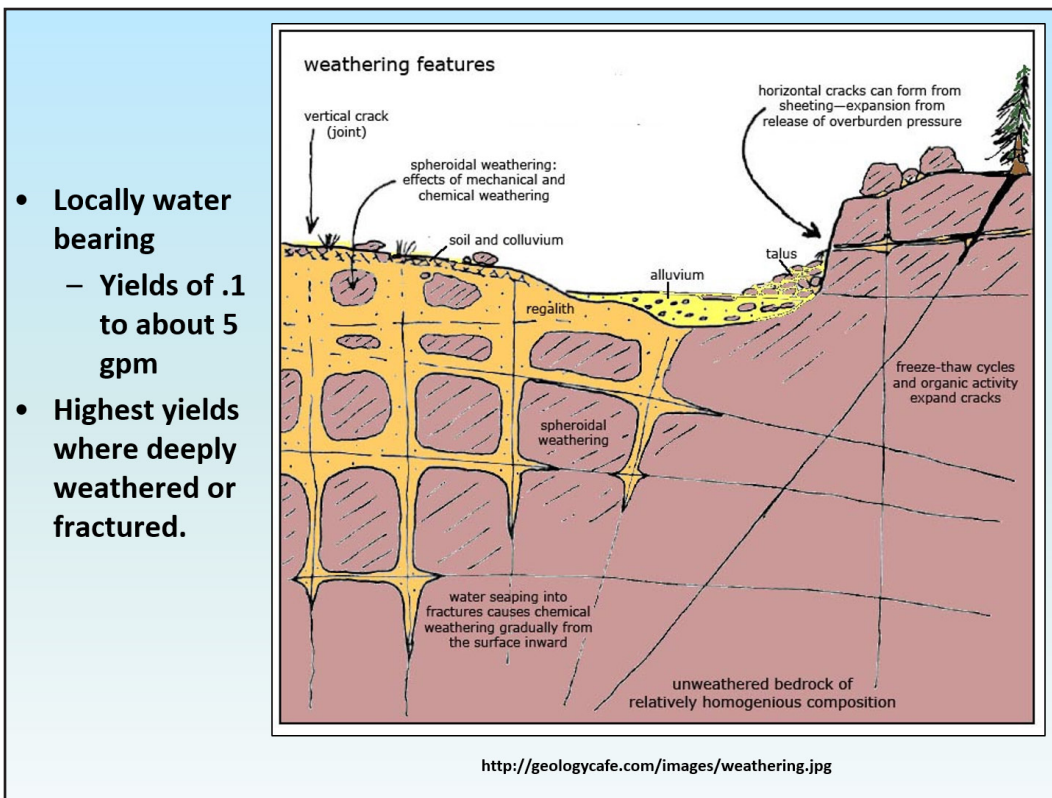


Figure 6. Aquifers in Proterozoic rocks.

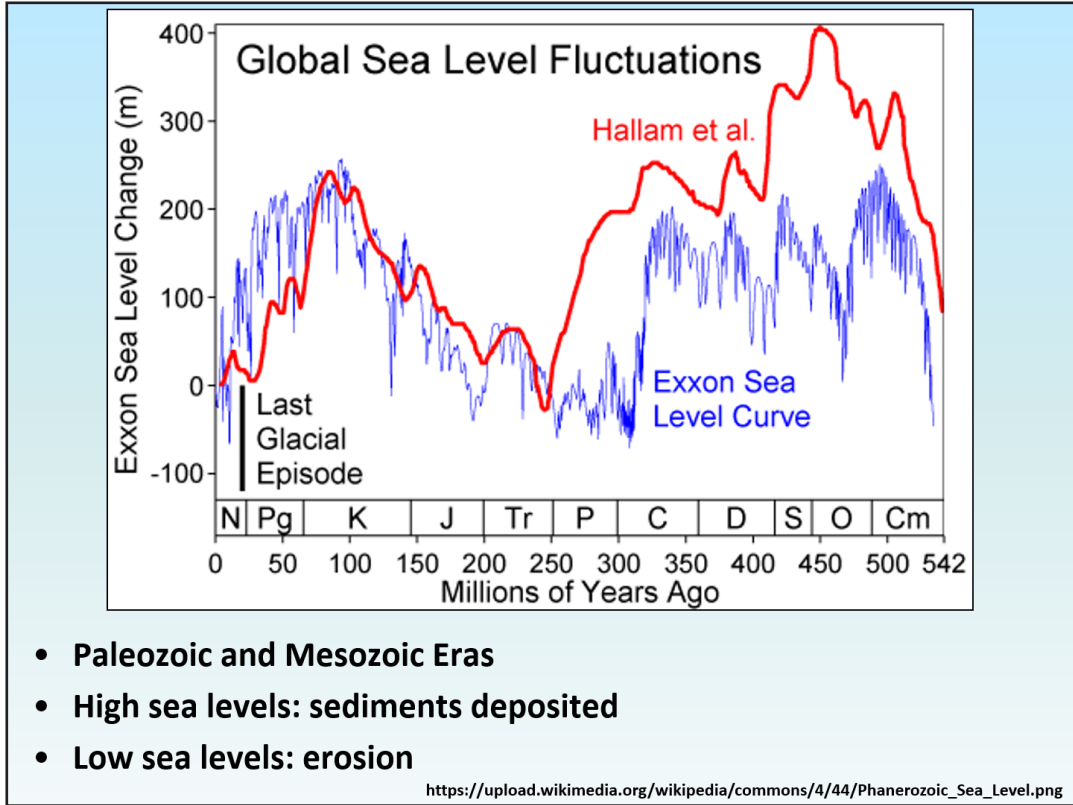


Figure 7. Rising and falling seas over millions of years.

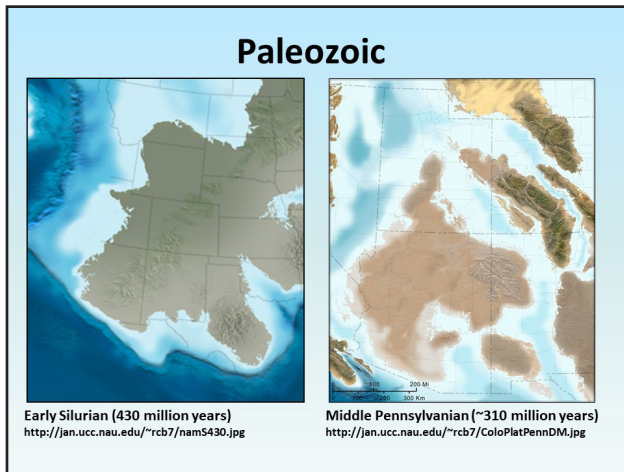


Figure 8. Sea levels in Paleozoic Era.

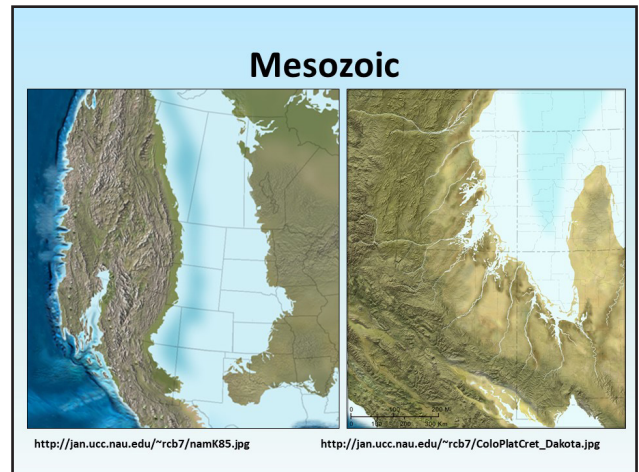


Figure 9. Sea levels in Mesozoic Era.

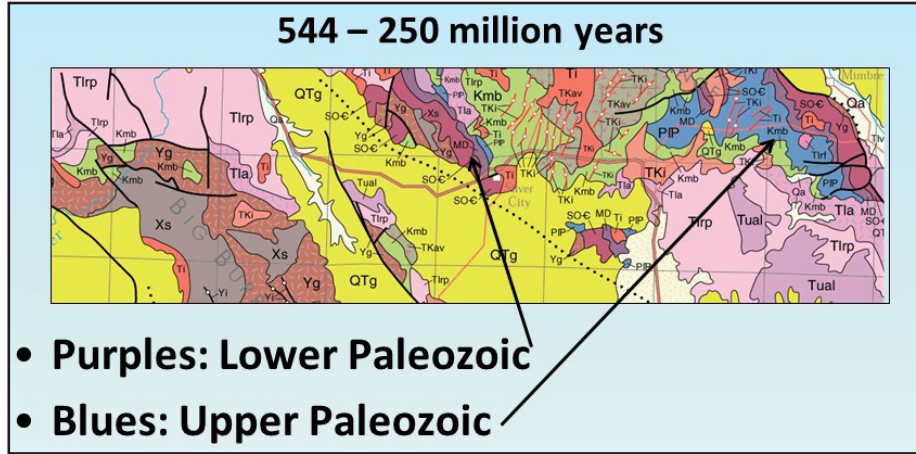


Figure 10. Paleozoic rocks.

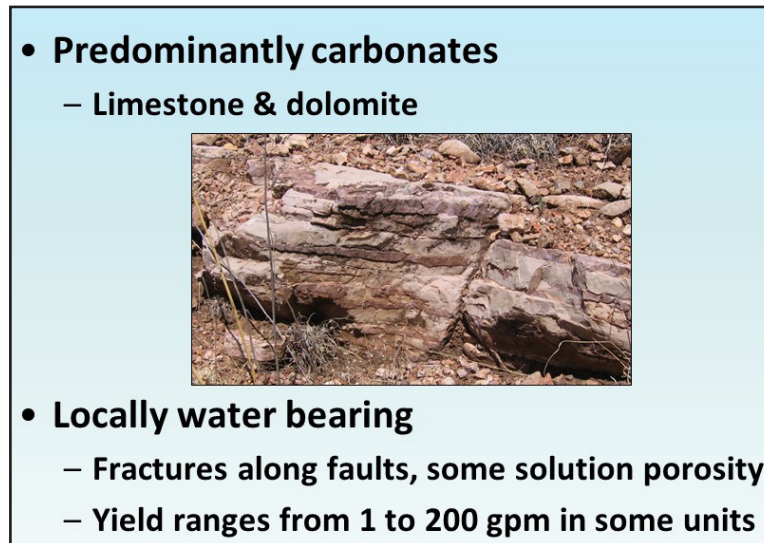


Figure 11. Paleozoic rocks (cont.).

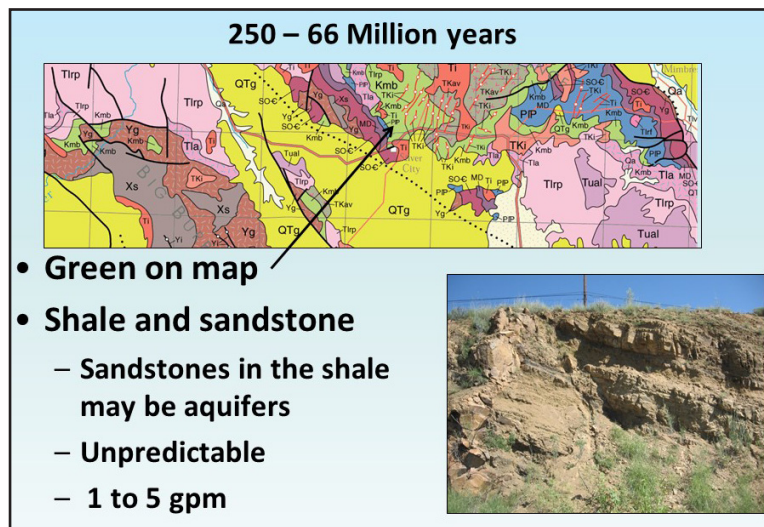


Figure 12. Mesozoic rocks.

• Events in NM related to tectonics along the Pacific Continental Margin

- Early Cenozoic
 - Subduction
- Late Cenozoic
 - Transform boundary
 - San Andreas Fault

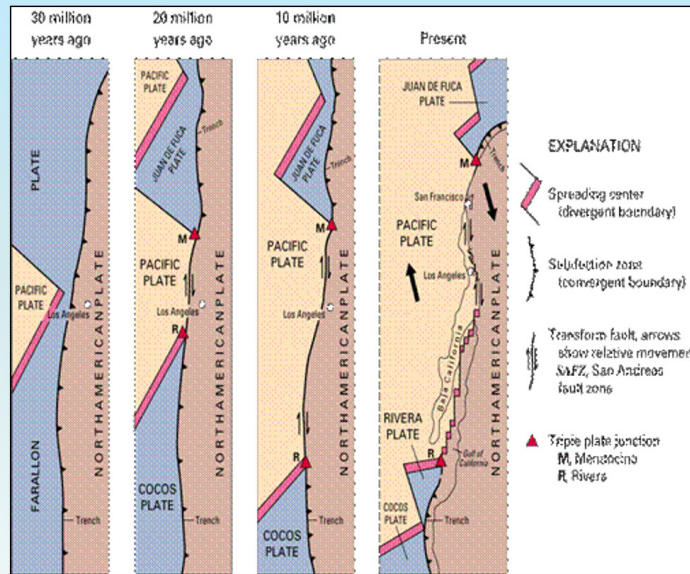
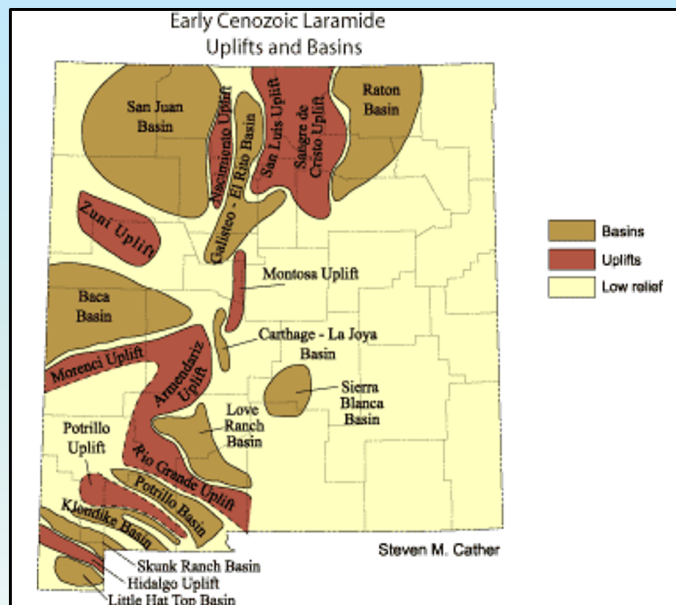


Figure 13. Cenozoic Era: shaping the landscape.

• Subduction on the west coast

- Igneous intrusions and mountain building in NM
- Porphyry Copper deposits
 - Chino
 - Tyrone
- Local uplifts
- Adjacent basins
 - Sediments



https://geoinfo.nmt.edu/tour/federal/rec_areas/angel_peak/cenozoic.gif

Figure 14. Laramide orogeny (55-70 my).

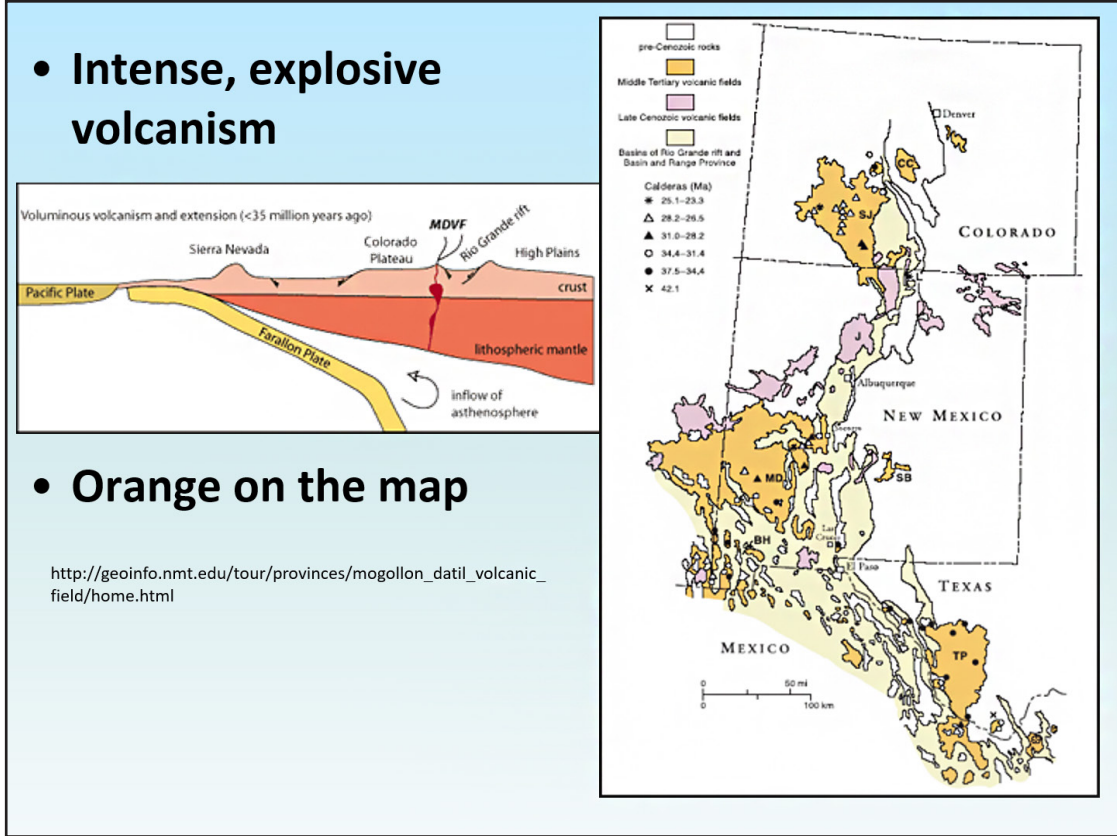


Figure 15. Ignimbrite flare-up (25-40 my).

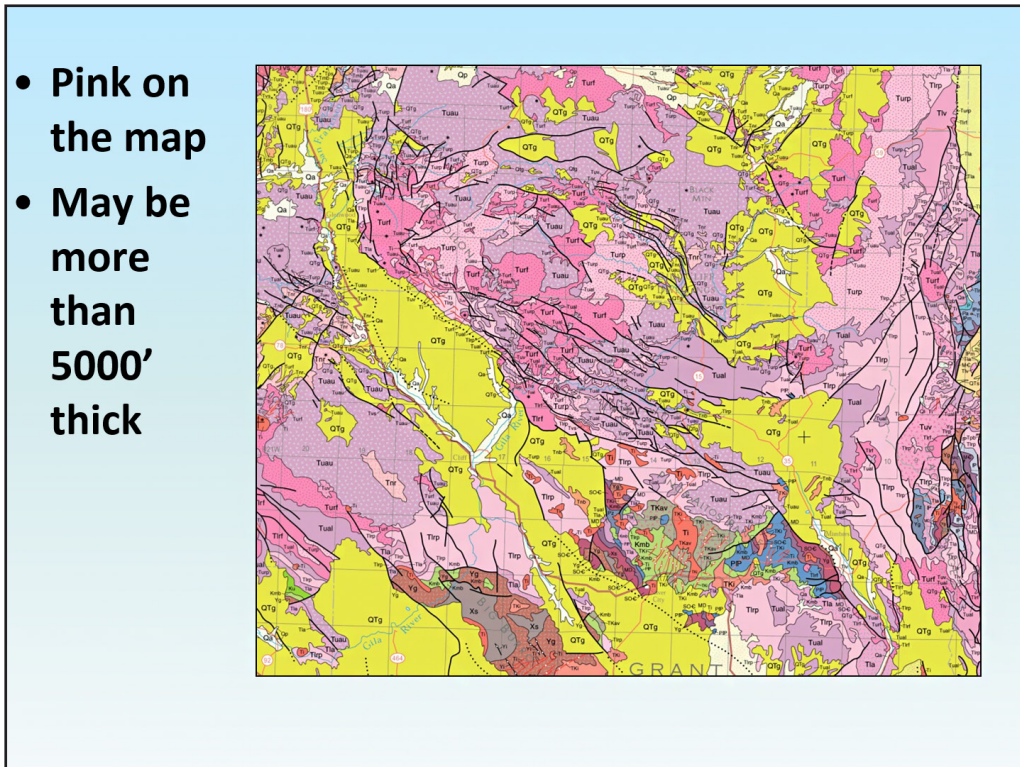


Figure 16. Cenozoic Era volcanic rocks.

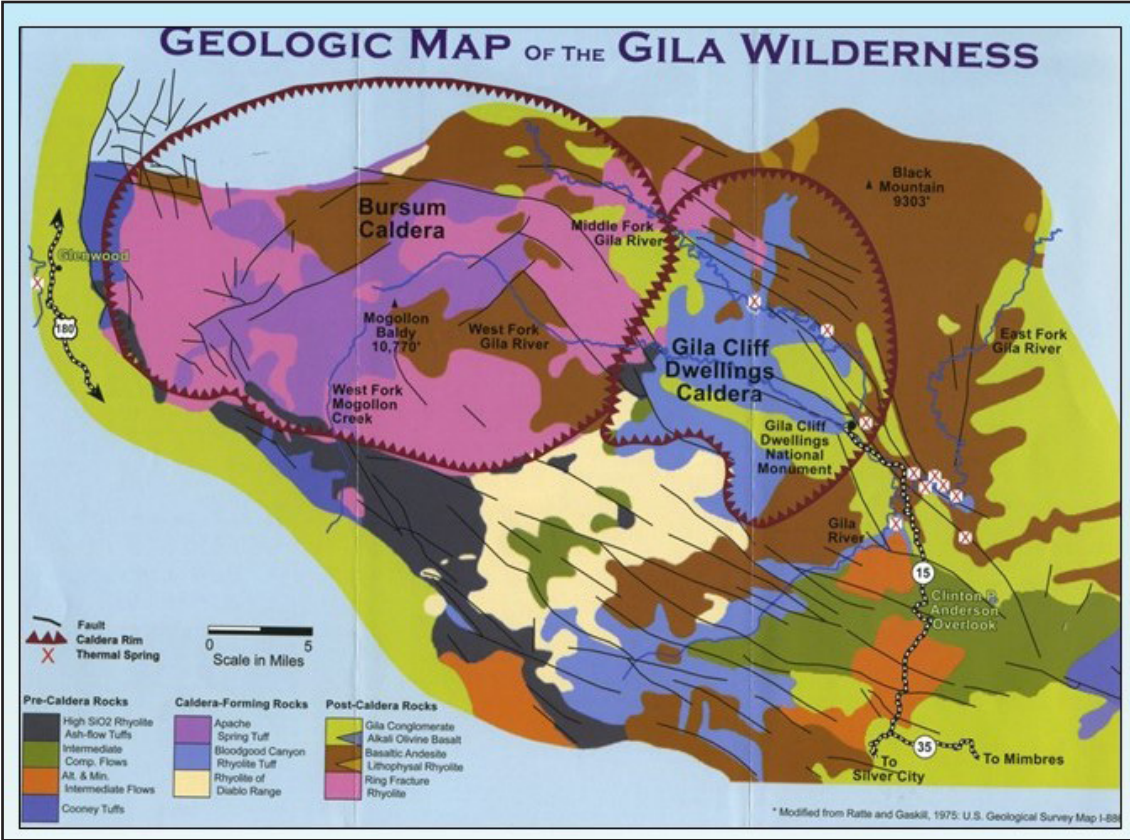


Figure 17. Caldera eruptions.

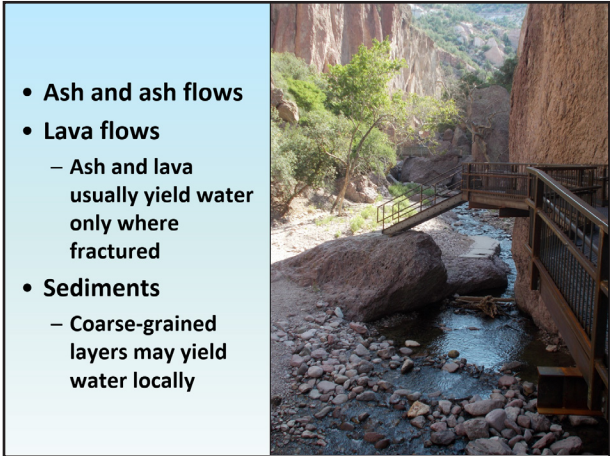


Figure 18. Variable rock types.



Figure 19. Ash deposits near Luna.

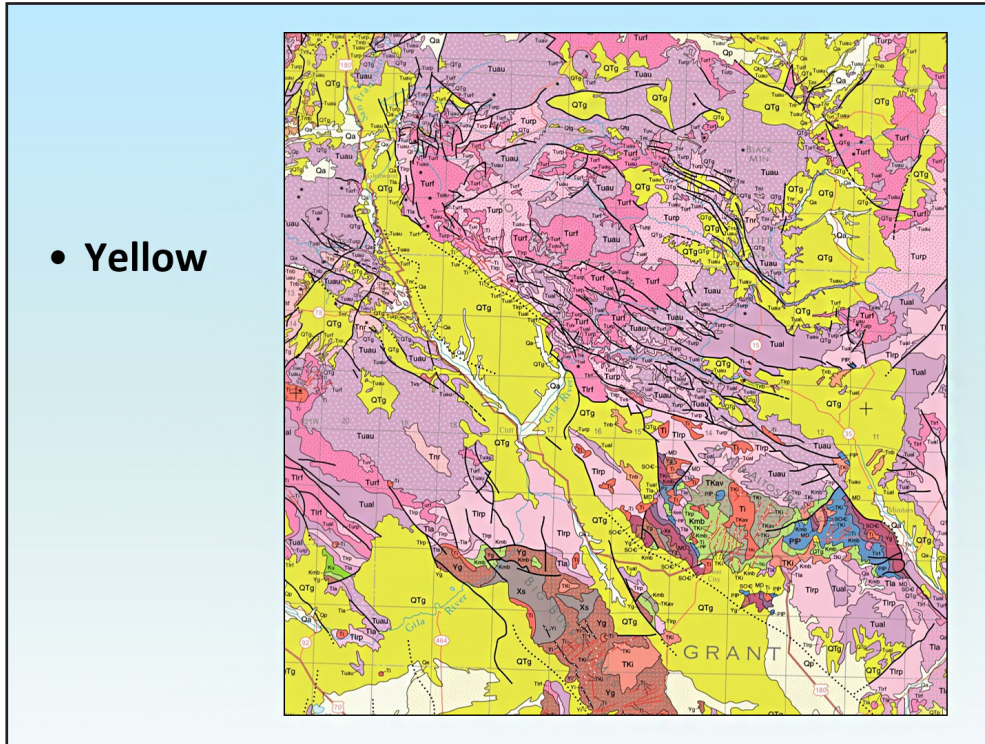


Figure 20. Late Cenozoic Era (15 my to present).

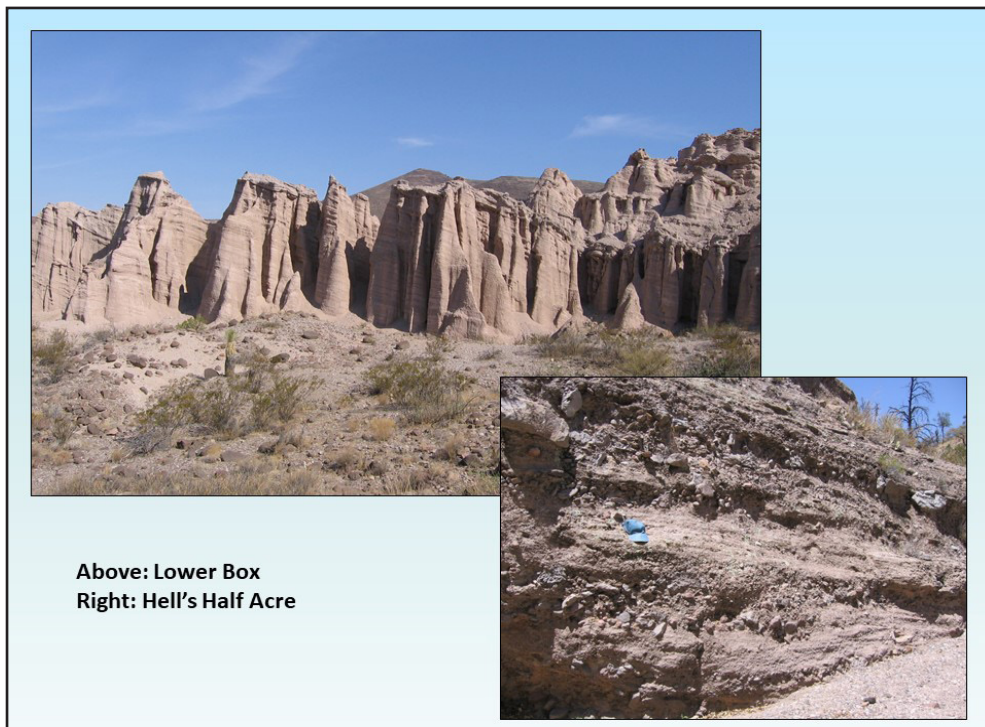


Figure 21. The Lower Box and Hell's Half Acre.

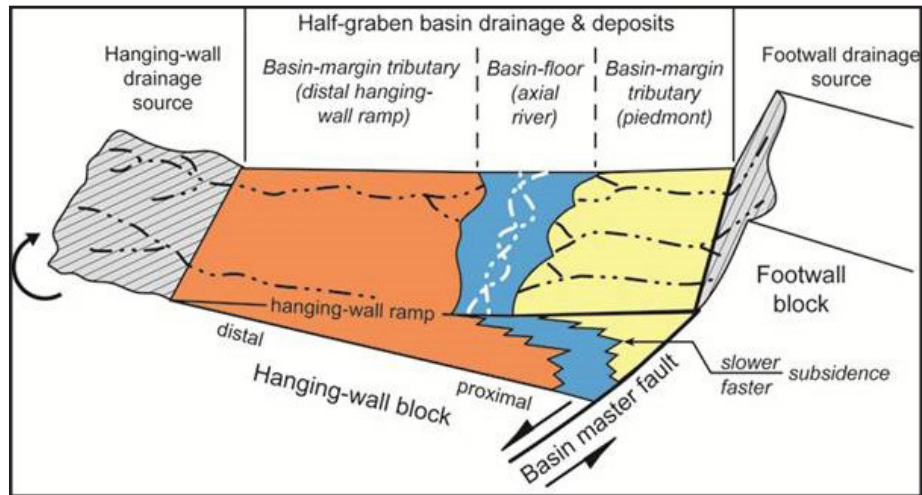


Figure 22. Mangas Valley.

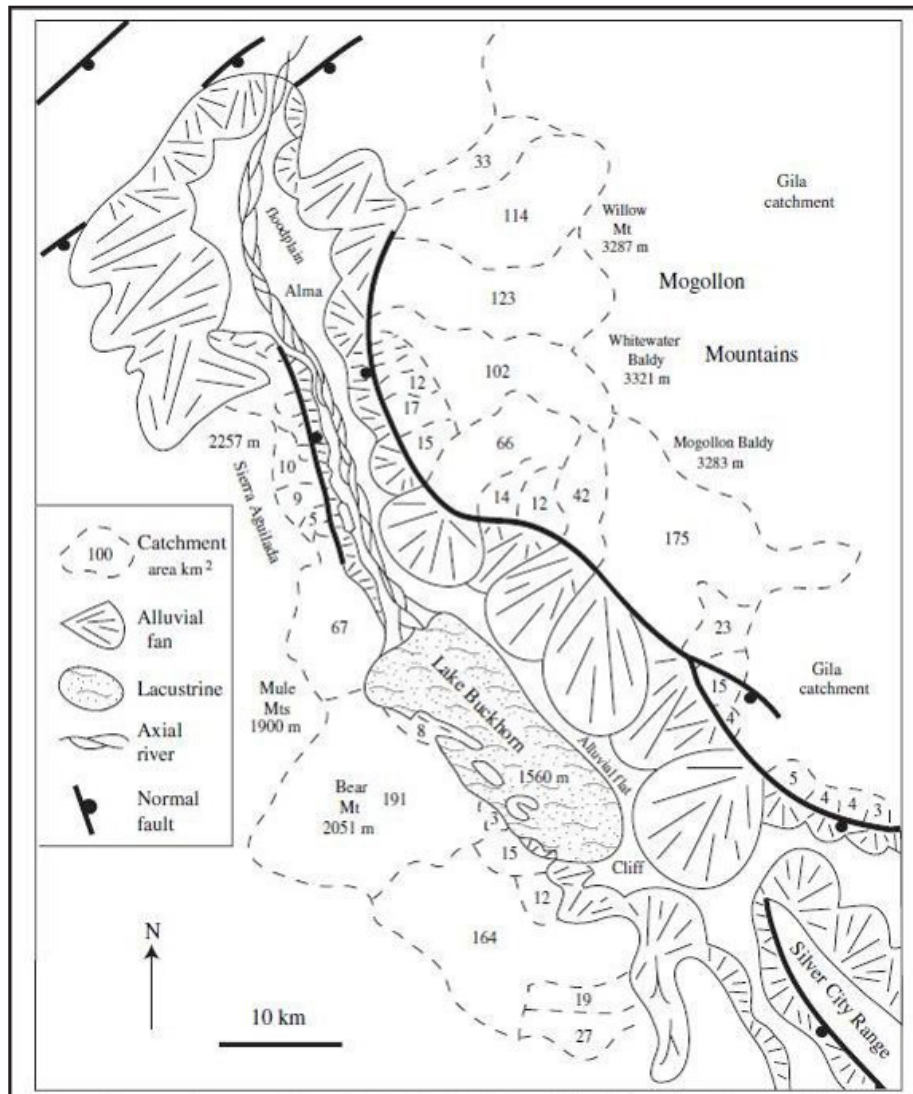


Figure 23. Mangas Valley (cont.).



Figure 24. Leopold Overlook.

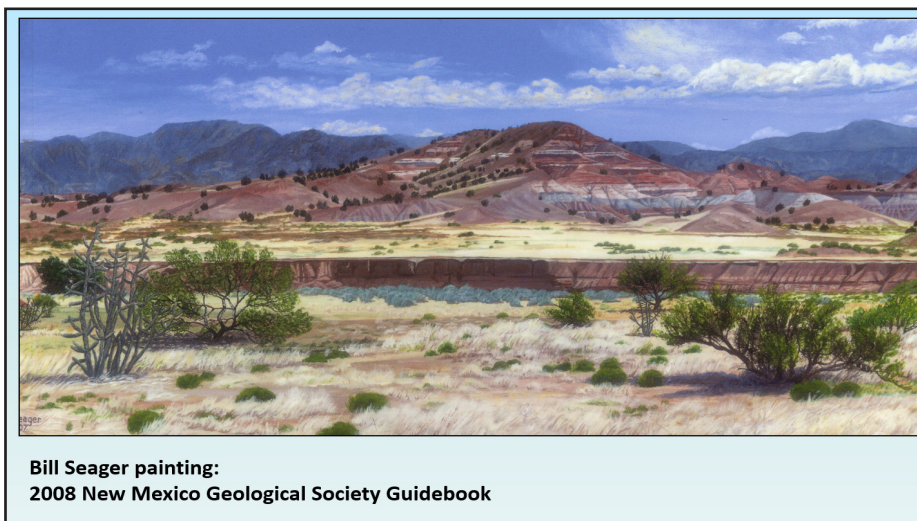


Figure 25. Buckhorn Lake Beds.

- **Gravel deposits: yield depends on degree of consolidation**
 - 1 – 2000 gpm
- **Alluvium in modern stream valleys**
 - Up to 2000 gpm, generally less than 500 gpm
- **Terrace gravels adjacent to larger streams**
 - 300 gpm

Figure 26. Aquifers.

- **The Gila drainage basin in New Mexico is underlain by rocks from Proterozoic to Recent in age.**
- **The volcanic rocks of the Mogollon-Datil field predominate.**
- **Late Cenozoic gravels found in extensional basins record recent (15 MA) geologic history of the region and are the best aquifers.**

Figure 27. Conclusion.