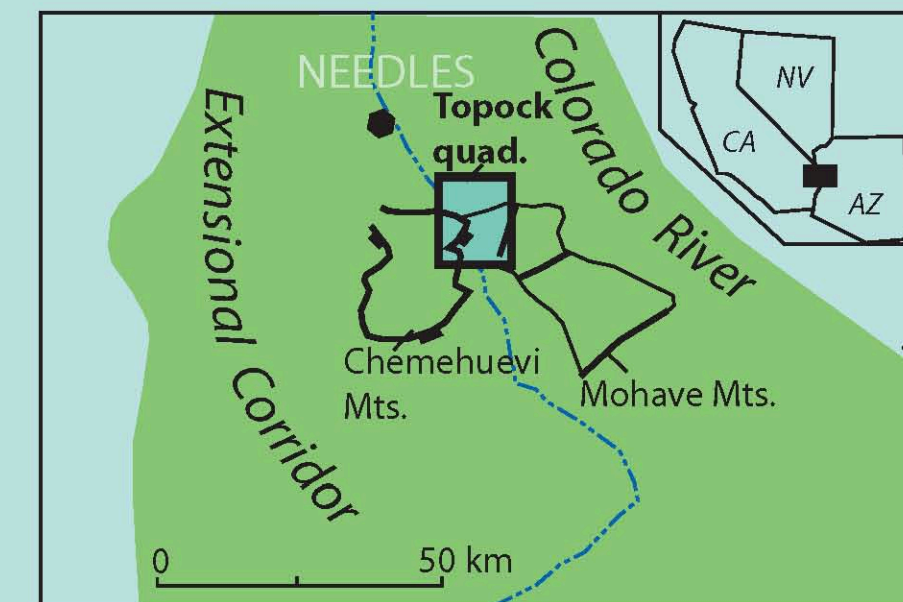


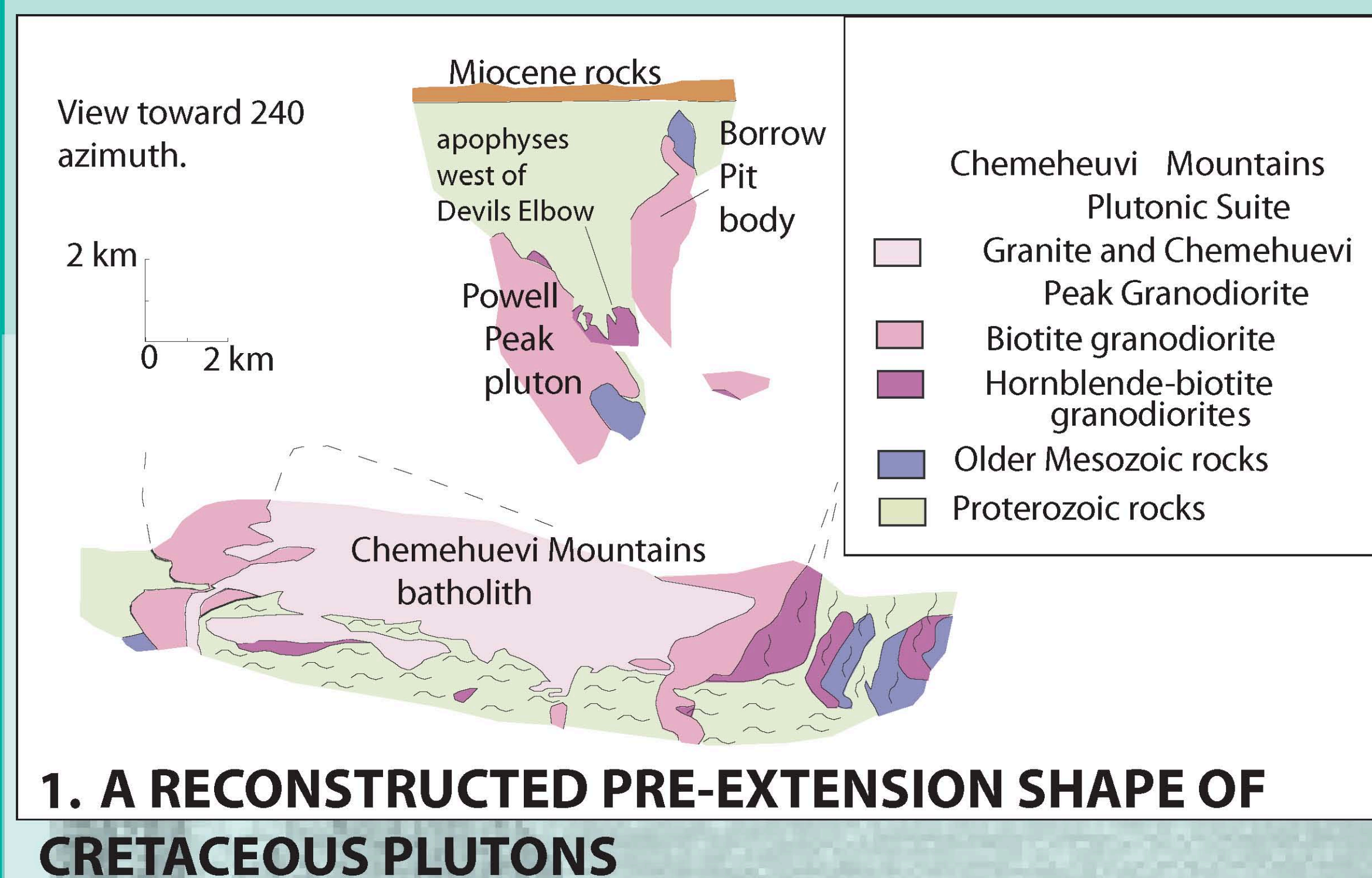
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K.A.Howard, B.E.John, J.L.Wooden
khoward@usgs.gov bjohn@uwyo.edu jwooden@stanford.edu

COLORADO RIVER STRATIGRAPHY, THE COLORADO RIVER EXTENSIONAL CORRIDOR, AND RECONSTRUCTED CRETACEOUS PLUTONS — TOPOCK GORGE, ARIZONA AND CALIFORNIA

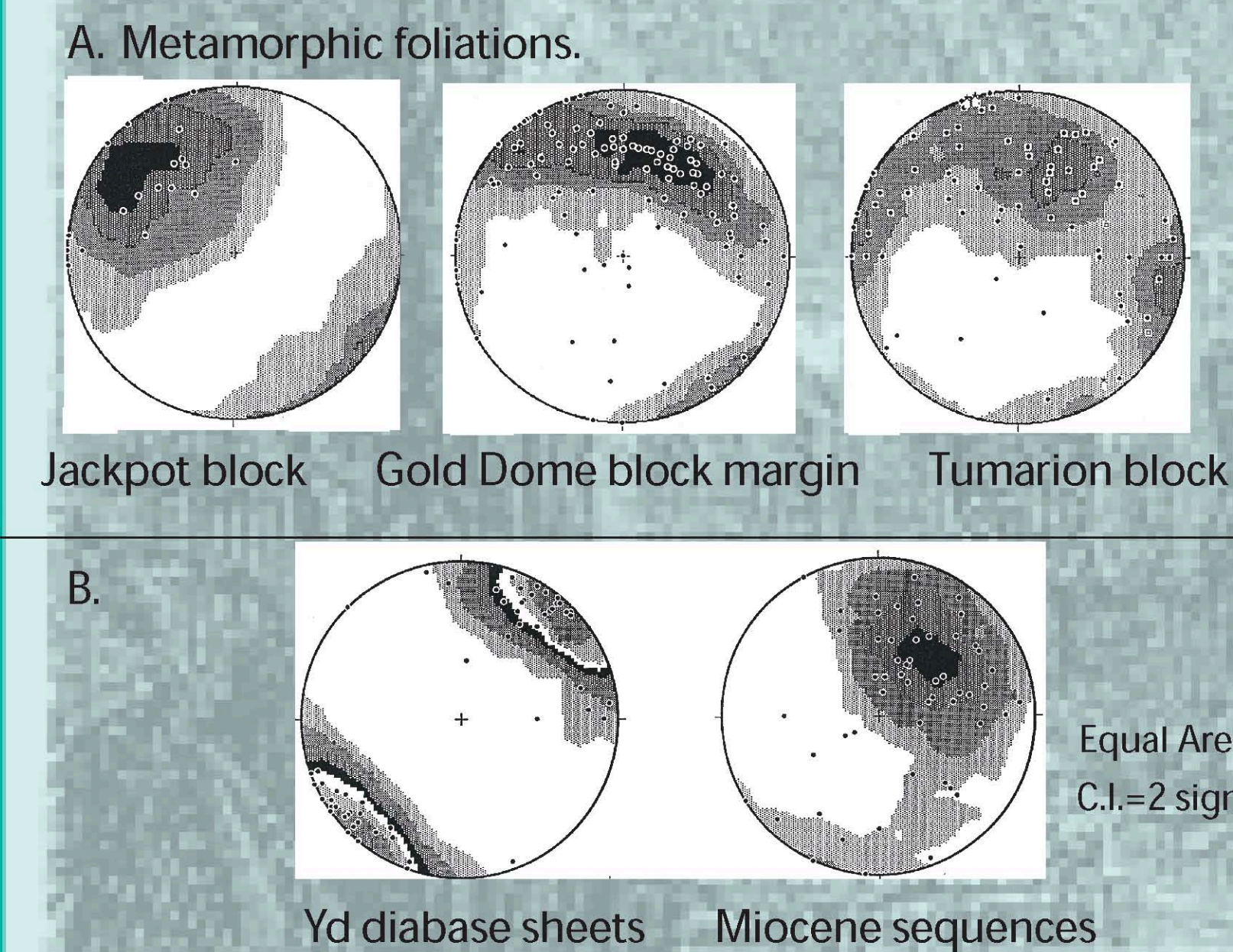


Location of the Topock quadrangle in the Colorado River extensional corridor.



Steeply tilted and dismembered plutons of the Late Cretaceous Chemehuevi Mountains Plutonic Suite in the east part of the quad restore structurally as cupolas capping the beheaded sill-like Chemehuevi Mountains batholith to the WSW, in California. The reconstructed batholith's shape is remarkably well defined.

2. Structural data in hanging-wall fault blocks.



A. Orientations of Proterozoic foliations show SW-plunging folds, which restore to NE plunges before Miocene tilting.

B. Steep, originally horizontal Meso-proterozoic diabase sheets (Yd) and Miocene stratal dips demonstrate steep SW tilting.

4. Thick (1–3 km) Miocene sections of volcanic rocks, sedimentary breccias, and conglomerate accumulated in the Colorado River extensional corridor, and record the corridor's structural and erosional evolution (J. Miller and B. John, 1999, GSA Bull.)

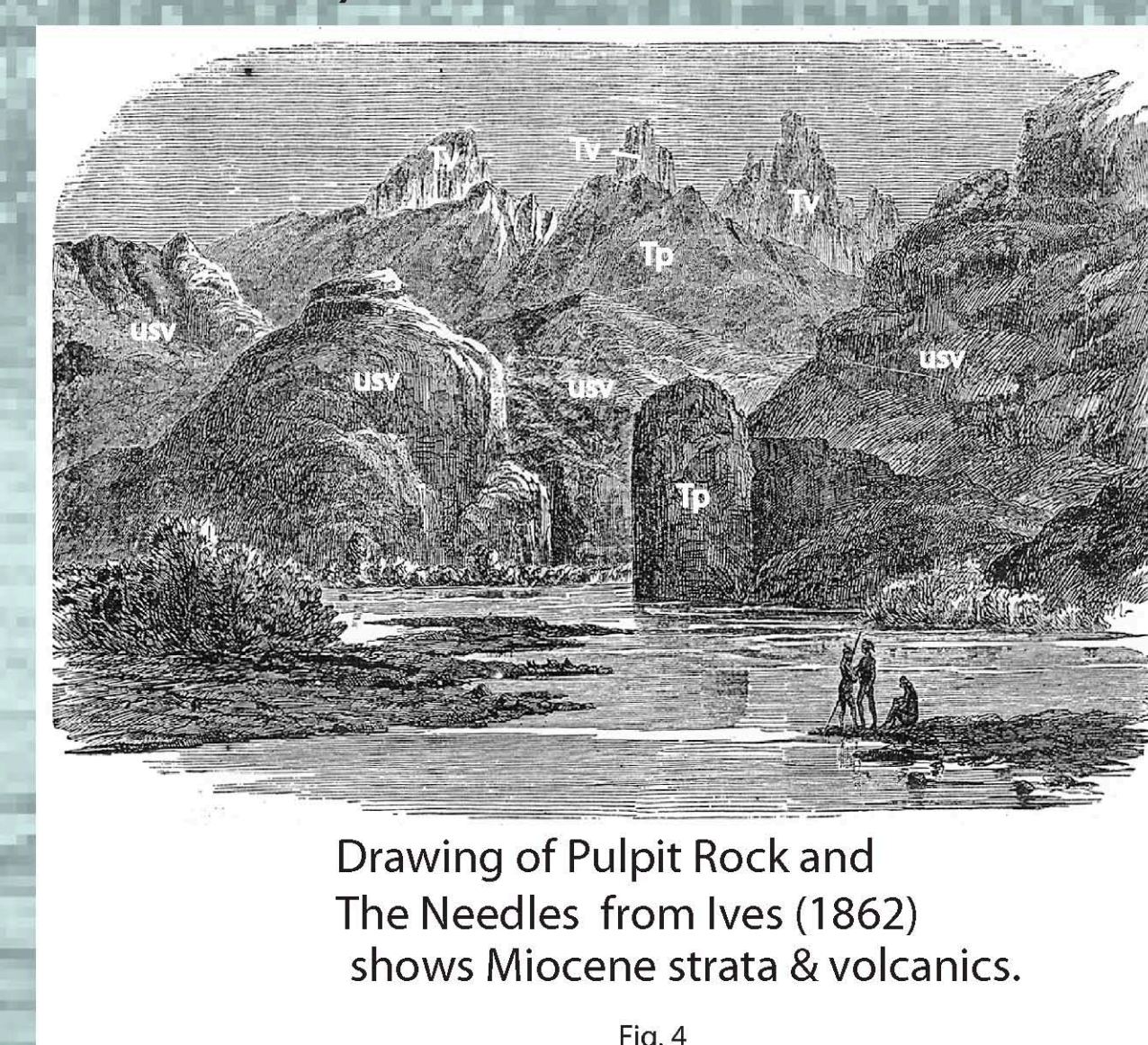
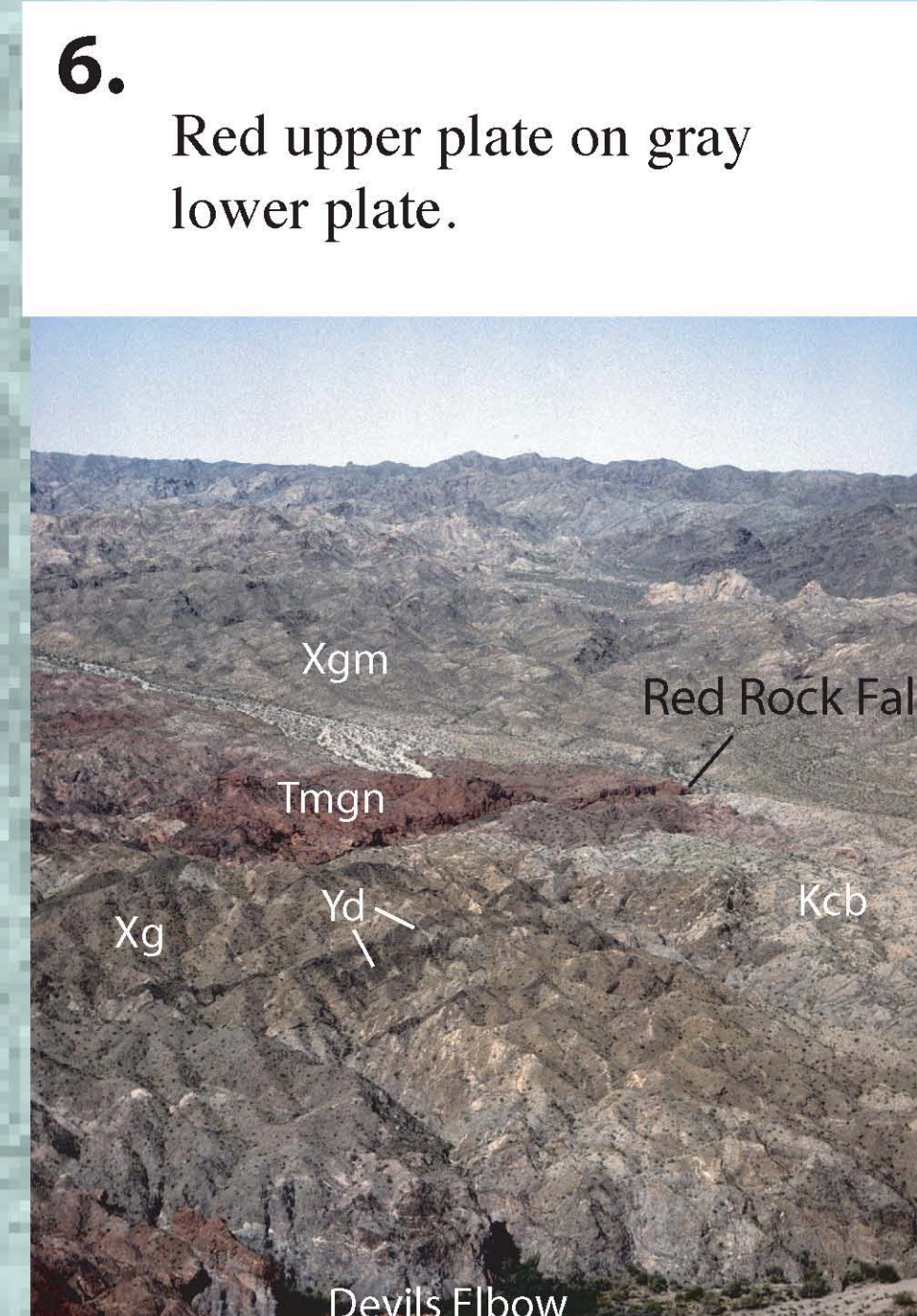
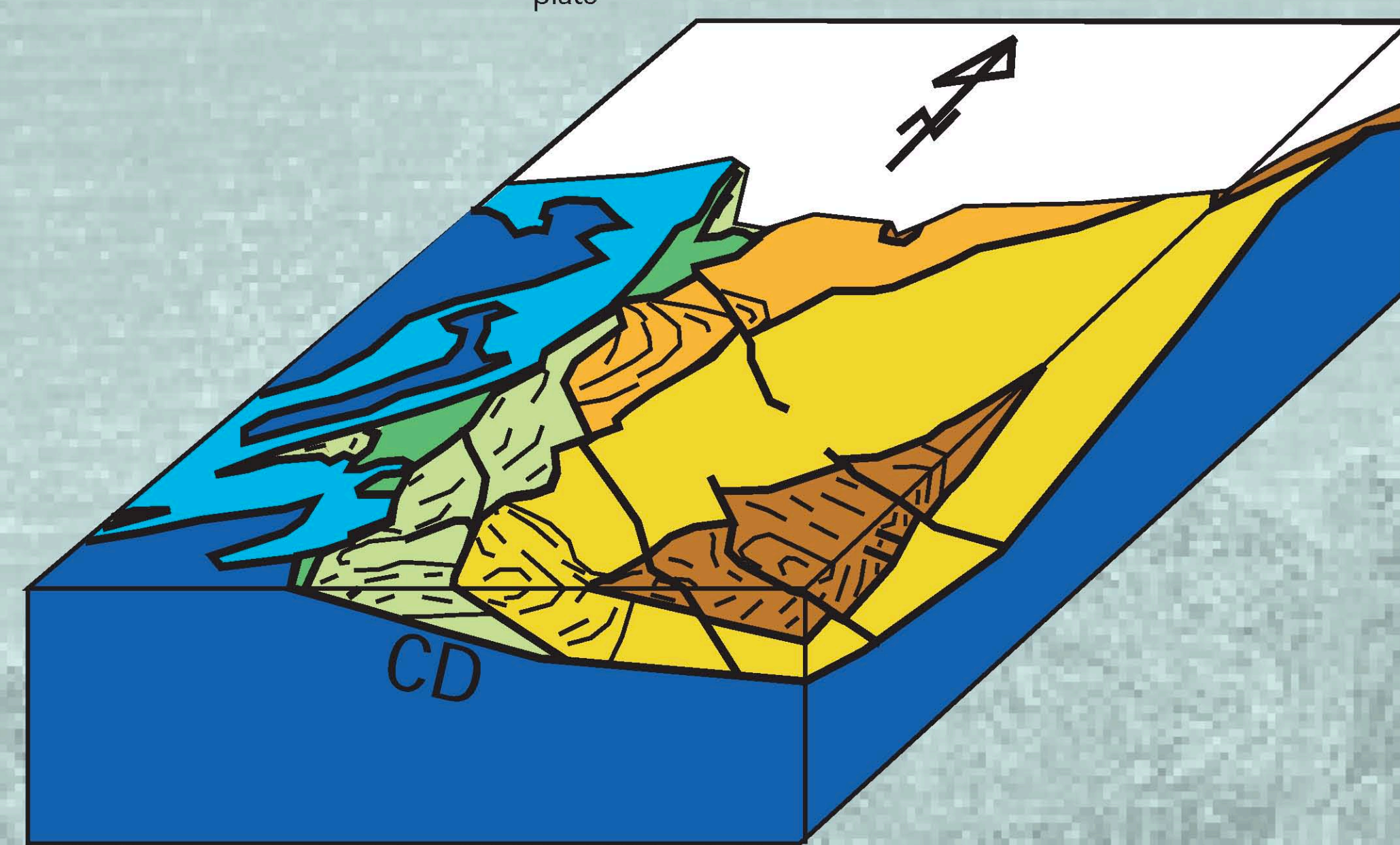
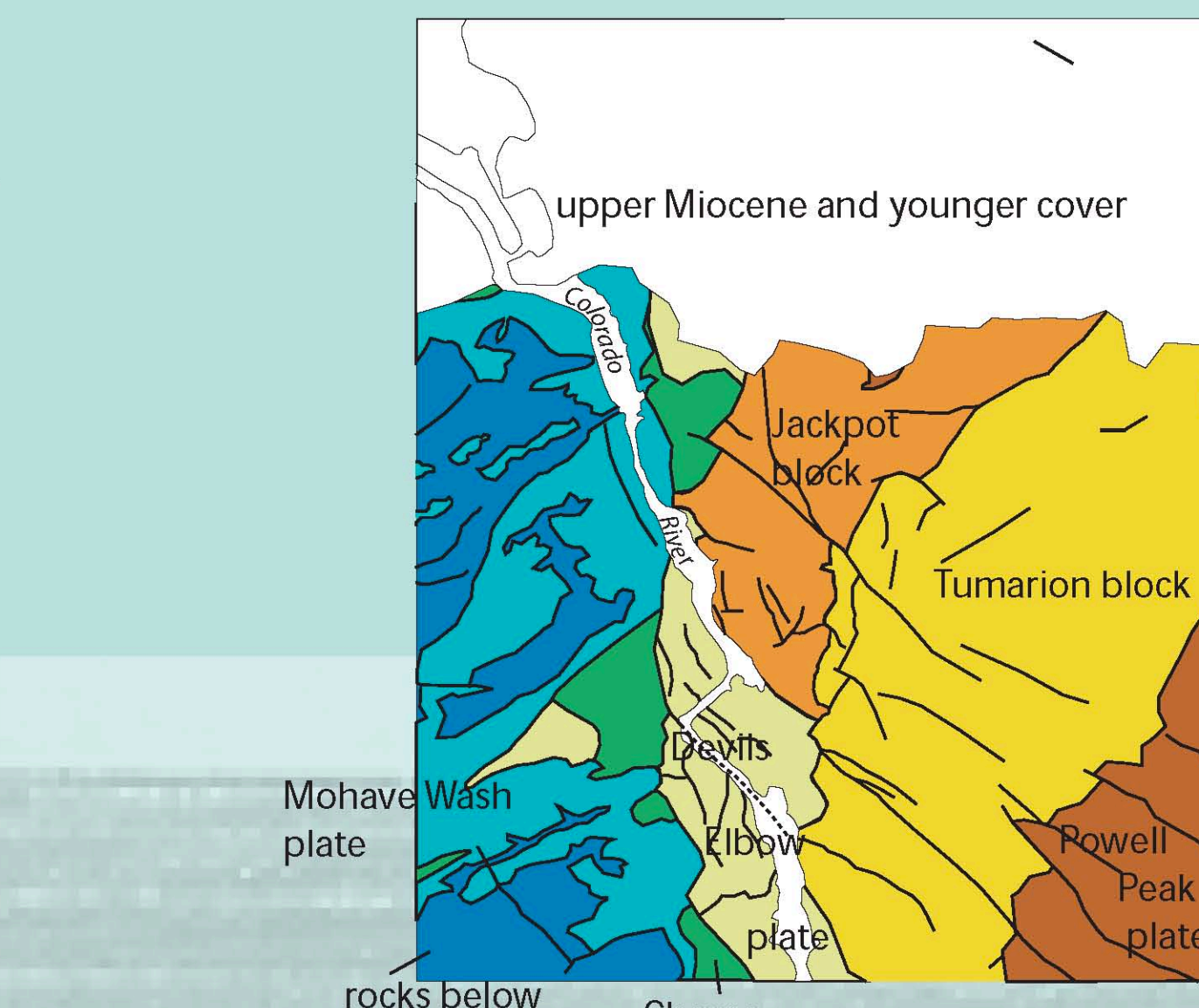


Fig. 4



SUMMARY

The Topock Gorge area, spectacularly exposed by Colorado River incision, reveals:

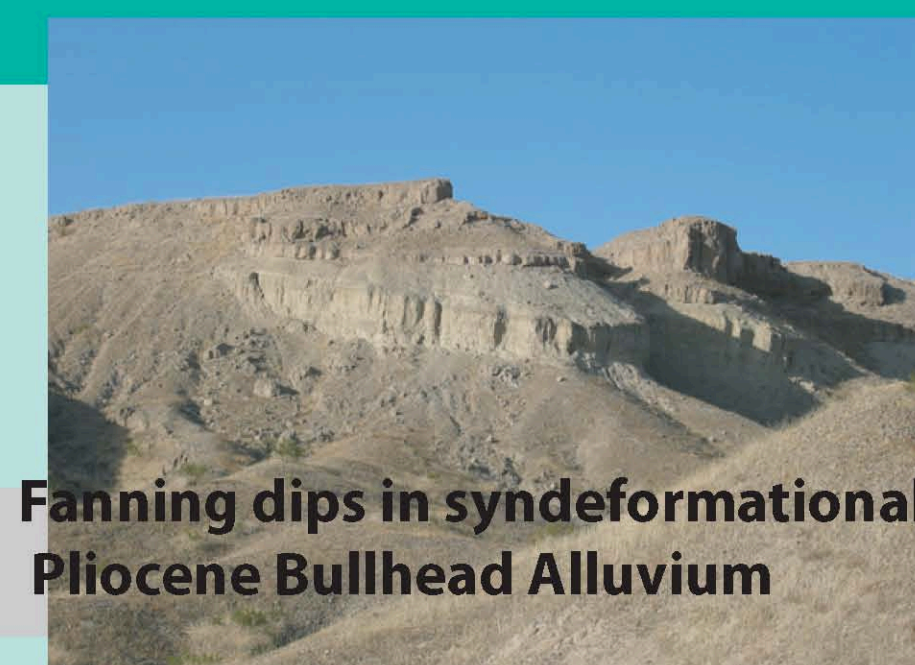
- Pre-tilt shapes and orientations of Proterozoic and (flat-floored) Cretaceous intrusions.
- Synextensional accumulation of kilometers-thick piles of Miocene volcanic and sedimentary rocks during major ENE-WSW extension.
- Structural relations between core-complex fault plates, large steeply tilted extensional hanging-wall fault slabs, forced fault-related folds, and intrusion into a triangular structural gap.
- Post-Miocene arrival of the Colorado River, and its multiple aggradations and re-incisions.

Background drawing of Topock Gorge is from Ives's (1862) "Report upon the Colorado River of the West"

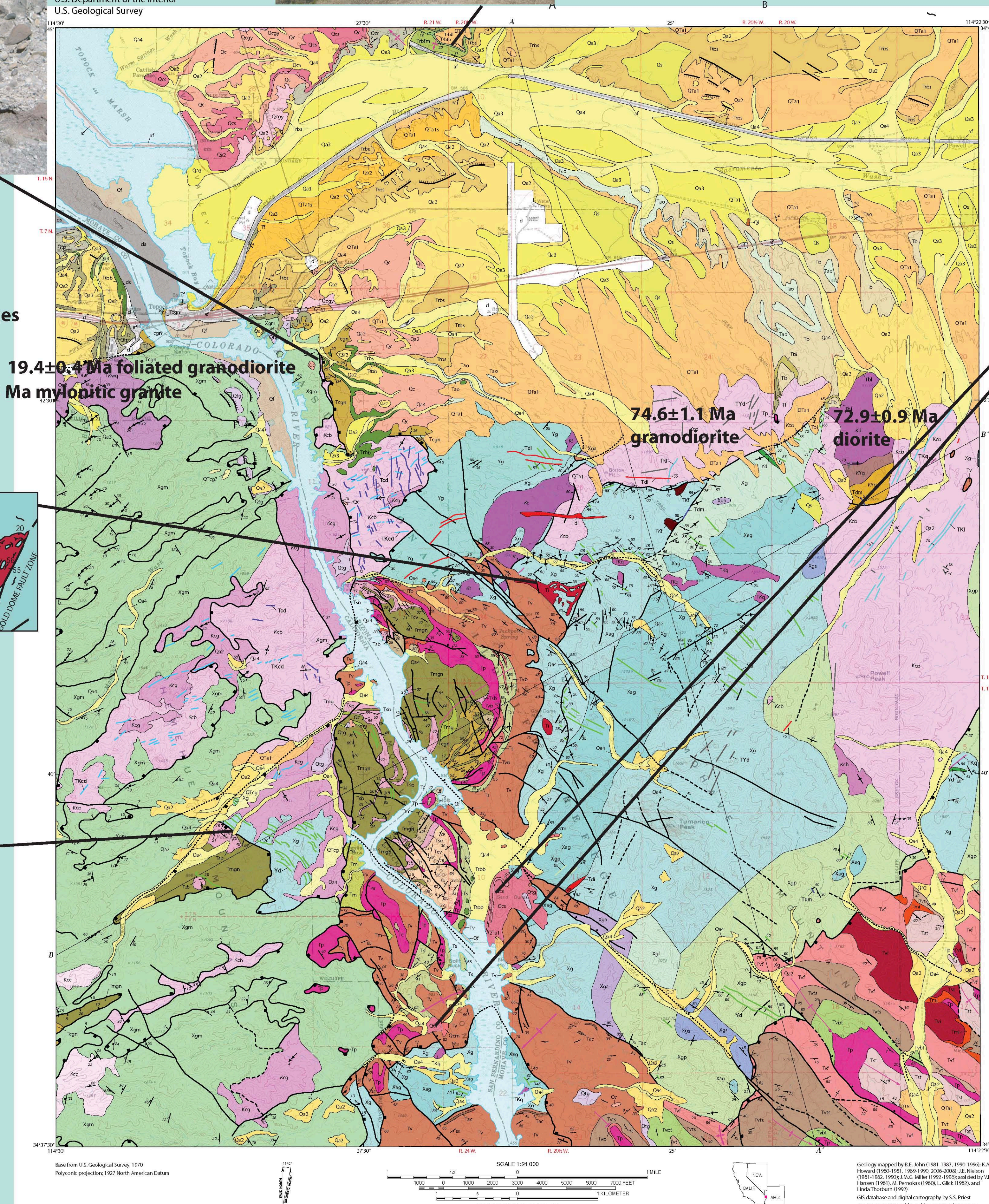
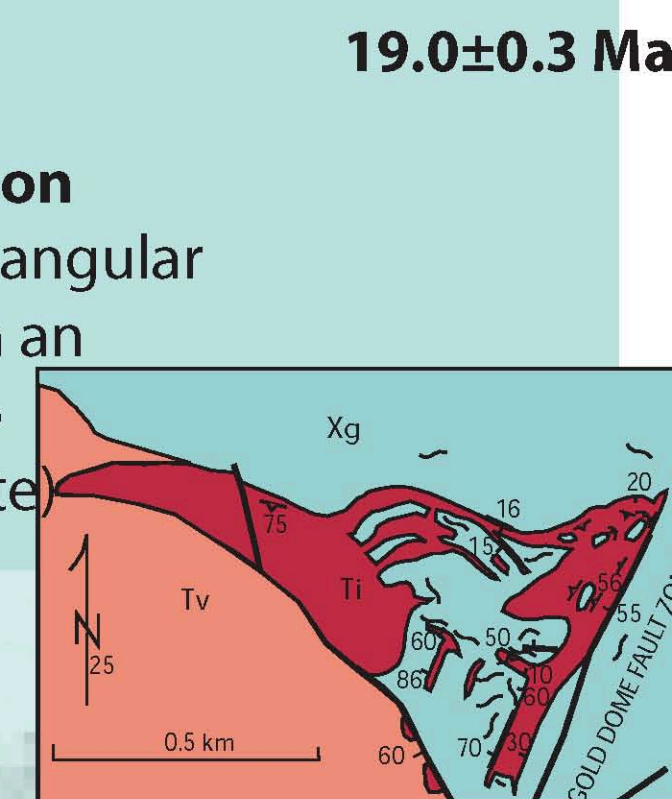
8. Pliocene(?) fluvial boulder conglomerate—a post-Bullhead Colorado River paleoflood.



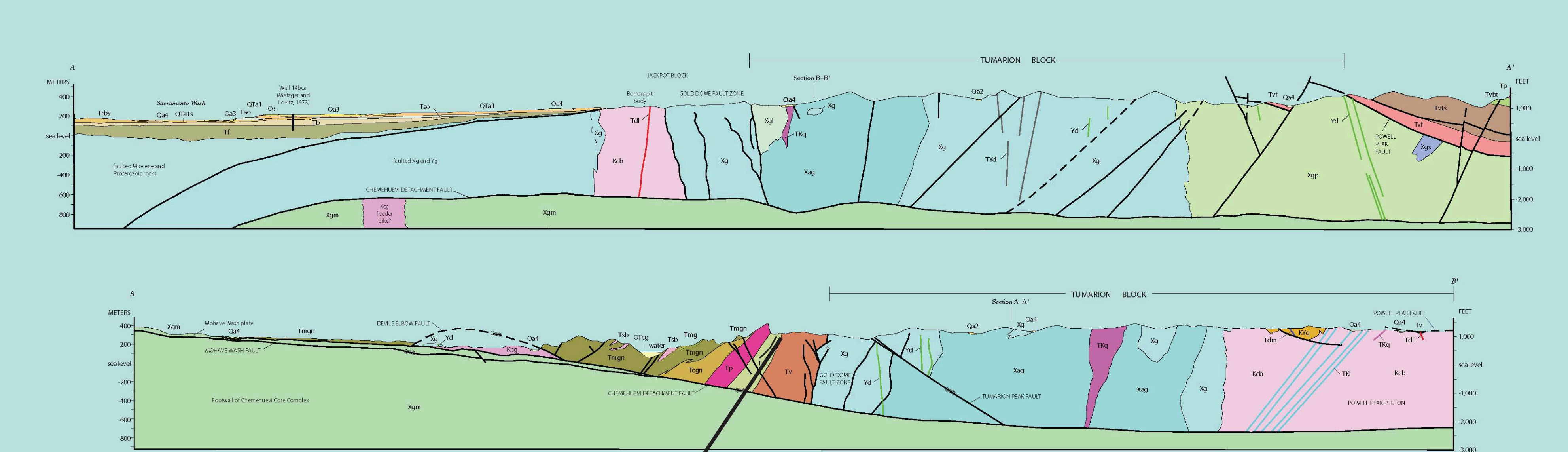
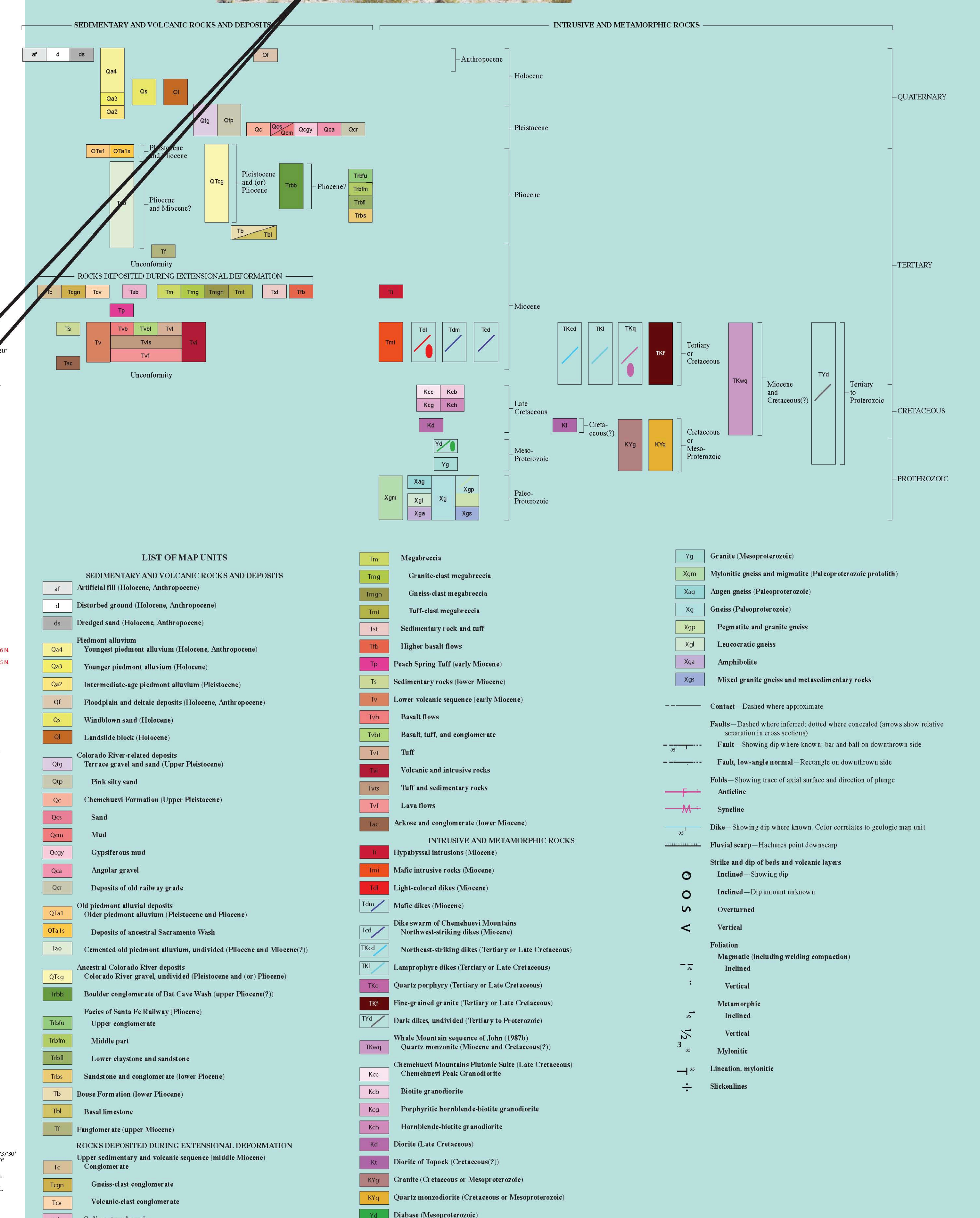
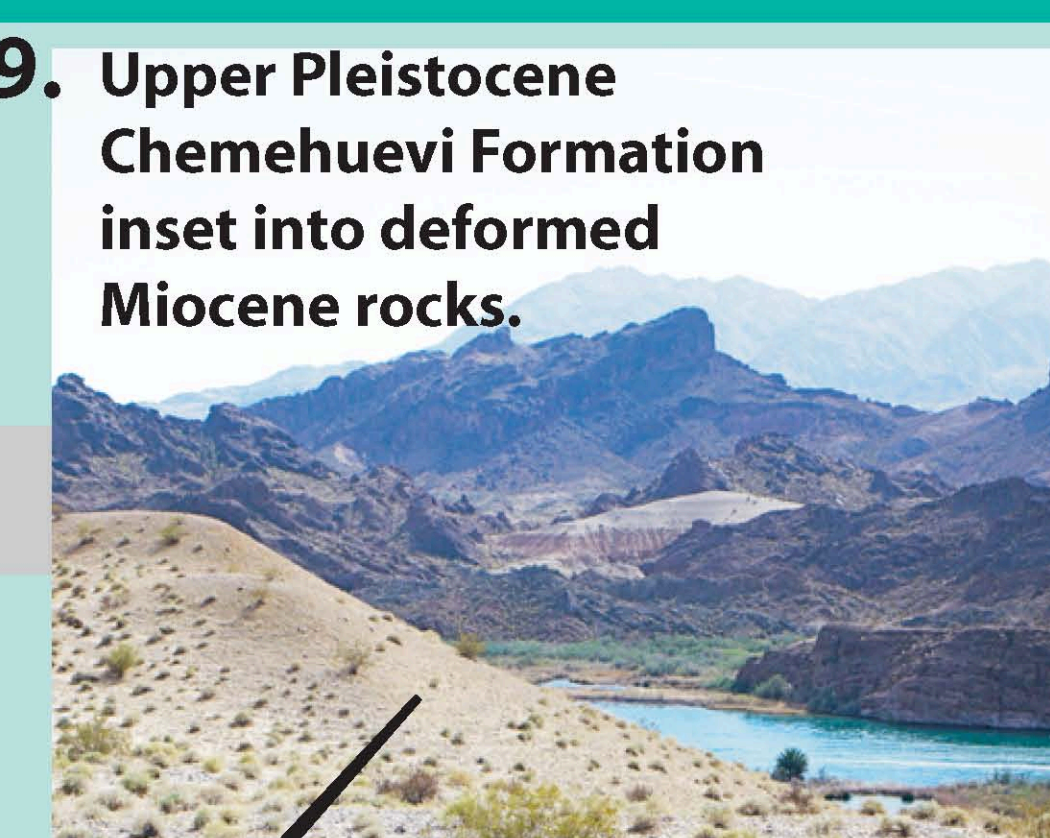
7. Fanning dips in syndeformational Pliocene Bullhead Alluvium



U-Pb SHRIMP ages on zircon



9. Upper Pleistocene Chemehuevi Formation inset into deformed Miocene rocks.



Geologic Map of the Topock 7.5' Quadrangle, Arizona and California

By Keith A. Howard, Barbara E. John¹, Jane E. Nielson², Julia M.G. Miller³, and Joseph L. Wooden⁴ 2013

<http://pubs.usgs.gov/sim/3236/>



Steeply dipping early Miocene rocks

GIS database by Sue S. Priest