Stratigraphy of the early Permian DeChelly erg in New Mexico

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Conclusions

- The lower part of the Yeso group lithosome is the DeChelly Sandstone (to the N/NW) and the Arroyo de Alamillo Formation (to the S/SE)
- DeChelly strata in NM are the SE portion of an erg that covered much of the 4 Corners during part of early Permian time
- Arroyo de Alamillo strata are deposits of an arid coastal plain deposited across much of central NM landward of the early Permian sea that occupied the Delaware basin to the SE
- Pinchout/gradation of the DeChelly into the Arroyo de Alamillo is well documented over ~ 1 km just N of Placitas on the northern end of the Sandia uplift



DeChelly Sandstone

Canyon DeChelly, Arizona



De Chelly vs. Arroyo de Alamillo formations

• DeChelly major eolian sandstones with large scale crossbeds • Arroyo de Alamillominor eolian sandstones, mostly tabular bedded fine sandstones, siltstones with intercalated beds of gypsum, dolomite



Erg vs. arid coastal plain

- We know the DeChelly erg covered much of the Four Corners during part of Leonardian time
- Where is the southeastern edge of the erg?
- How are the erg deposits related to the arid coastal plain deposits to the southeast?





- Type section of "Meseta Blanca Member"
- DeChelly is 82 m thick.
- ~ lower 40 m includes some waterlaid strata
 Overlain by silty and gypsiferous San Ysidro Formation



Zuni Mountains

• DeChelly Sandstone is 77 m thick Below San Ysidro Formation Major facies change to west into Supai Group strata of eastern Arizona



Lucero uplift

DeChelly Sandstone70 m thick





Mesa del Yeso

- Type section of Arroyo de Alamillo Formation
- 107 m thick
- Largely siltstone with interbeds of sandstone (mostly laminar and ripple laminar) and beds of dolomite and gypsum Basal dolomite interval of **Torres Member of Los Vallos** Formation overlies it (has middle Leonardian conodonts in the Caballo Mountains)



Abo Pass

- Arroyo de Alamillo Formation
- o 60 m thick
- Skeleton of varanopid eupelycosaur—the only fossil bones known from the Yeso Group





Fra Cristobal Mountains

 Arroyo de Alamillo
 Formation 81 m thick
 Mostly ripplelaminated sandstone with interbeds of siltstone, gypsum and dolomite



Caballo Mountains

- Arroyo de
- Alamillo
- o Formation
- 74 m thick
- Similar to
- section in
- Fra Cristobal Mountains
 What happens
 to the east and
 - southeast?





Placitas (N end Sandia Mountains



Stratigraphy and paleogeography

De Chelly erg had its southeastern edge in northern NM during part of Leonardian time South of the erg, deposits of an arid coastal plain are the Arroyo de Alamillo Formation South and east of that more research needed.



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