Modern boundary is a normal fault.
Clasts are the deep water cherts from the west, not the carbonates seen to east.
Paleozoic Tectonic Domains of Nevada

Figure 1. Extent of lower Paleozoic Shelf domain with outcrops shown. Refer to Crafford (2007) for detailed explanation of geologic units.

Legend

- Lower Paleozoic Shelf Domain

Colored areas show actual outcrops; see Crafford (2007) for list of units and complete descriptions.
however, consider this quote from Cashman et al. 2011: “However, the age of folds and faults attributed to the Antler orogeny are not well constrained—the deformed rocks commonly range from Ordovician to Devonian in age, but no strata overlying these deformed rocks are older than Pennsylvanian. Based on these relationships, the deformation is permissibly much younger than the Late Devonian–Early Mississippian Antler orogeny.”
Lower Paleozoic Shelf Domain
Slope Domain
Basin Domain
Foreland Basin Domain

Legend

Colored areas show actual outcrop. See Crafford (2007) for list of units and complete descriptions.
Burchfiel and Royden, Geology, 1991

Late Paleozoic tectonic elements

Burchfiel and Royden, Geology, 1991
Deposits of carbonate turbidites and debris-flows, such as the McColley Canyon Formation along the slope and basin margin, are critical for establishing the position of the carbonate-shelf margin. In northern Nevada, the apparent juxtaposition of carbonate-shelf margin positions is largely due to the Alamo Impact and the formation of the Alamo Breccia, as indicated in Figure 3.

In the late Lochkovian, laminated, turbiditic to debris-flow deposits of the McColley Canyon Formation along the slope and basin margin mark the top of the Lone Mountain Dolostone. The boundary depositional hiatus and unconformity are evidenced by facies trends and depositional patterns including development of the Tor Limestone also developed west of the Tooele Arch. Additionally, the Pioche Member of the McColley Canyon Formation characterizes wide, persistent Devonian structural features.

Carbonate-shelf margin positions through the Devonian are represented by the part of restored paleogeographic map in Figure 1. nepaticostatus and inversus-Zones. The hypothesis of a carbonate-shelf margin position is further strengthened by the distribution patterns and abrupt thickness changes in Lower and Middle Devonian rocks along and adjacent to the margin in central and northern Nevada, shelf-margin and intrashelf basins. The shift in carbonate-shelf margin positions in northern Nevada is largely due to Antler orogenic compression and overthrusting.

Late Devonian: Nepaticostatus Zone
Mid-Devonian: Costatus Zone
Early Devonian: Inversus-Zone

Morrow and Sandberg, Geosphere, 2008
arrows are turbidity current directions
lower Upper Devonian

Giles & Dickinson, SEPM SP 52, 1995
Depositional settings are interpreted from the stratigraphic record. For example, turbiditic units are common in the foreland basin and are indicative of a submarine fan environment. Mudstone units, which are typically interpreted as shelf deposits, are present in the forebulge and backbulge basins. Carbonate units, which are indicative of a passive margin setting, are present in the forebulge and backbulge basins.

The sequence stratigraphic framework is based on the interpretation of unconformities and sequence boundaries. Unconformities are identified as periods of non-deposition, while sequence boundaries are defined as the transition from one depositional system to another. The sequence stratigraphic framework is used to interpret the evolution of the depositional environment over time.

The study area is located in the middle Upper Devonian, which is characterized by the deposition of thick sequences of sandstone and shale. The sandstone units are interpreted as depositional equivalents of submarine fans, while the shale units are interpreted as shelf deposits. The sequence stratigraphic framework is used to interpret the evolution of the depositional environment over time.
Upper Upper Devonian

Fig. 8.—Cross section A to A’ displaying Sequence 5 (Lower Pa. marginifer to Upper Pa. marginifer conodont zone) foreland strata.
uppermost Upper Devonian

Fig. 9.—Cross section A to A' displaying Sequence 4 (Lower Pa. expansa conodont zone) foreland strath.

Giles & Dickinson, SEPM SP 52, 1995
The depositional history of the middle Lower Mississippian includes bioturbated fossiliferous chiopods, packstone argillaceous sandstone, and limestone near 202.

At the base of the sequence, megafauna calcareous fauna are present, indicating a significant change in the environment.

This deposition is interpreted as a ramp setting with detrital input from the west and carbonate input from the east.

The sequence is characterized by thinning upward beds, with beds in the upper part being thicker than in the lower part.

The diagram shows the relationship between the Foreland basin, Thrusted Roberts Mountains allochthon, and the Forebulge, with various strata and thicknesses indicated.

Giles & Dickinson, SEPM SP 52, 1995
Upper Lower Mississippian

KATHERINE A. GILES AND WILLIAM R. DICKINSON

I. Post-tectonic Phase

II. Roberts Mountains allochthon

Upper Chester

Lower Chester

Upper Meramec

Lower Meramec

Upper Osage

Lower Osage

Overlap Assemblage

FIG 14

Cross section displaying post-tectonic strata Lower to Upper Mississippian lower correlation line is base of Upper Typicus conodont zone and upper correlation line is near top of Chesterian stage but basal Ely Limestone part of the overlap assemblage is also Chesterian in age see text.

Ages of biostratigraphic markers based on conodont, ammonoid, brachiopod, foraminiferal, and coralline data derived from Poole and Sandberg 1991.

Note change of scale from Figures 6-13.

Giles & Dickinson, SEPM SP 52, 1995
Upper Mississippian

KATHERINE A GILES AND WILLIAM R DICKINSON

Post-tectonic Phase

West Roberts Mountains allochthon

Diamond Range

Overlap Assemblage

Confusion and Needle ranges

Tintic Mountains and Star Range

Biostratigraphic markers

U.Ch Upper Chester
L.Ch Lower Chester
U.M Upper Meramec
L.M Lower Meramec
U.O Upper Osage

Ages of biostratigraphic markers based on conodont, ammonoid, brachiopod, foram, and coral data derived from Poole and Sandberg 1991

Note change of scale from Figures 6-13

FIG 14 Cross section A to A' displaying post-tectonic strata Lower to Upper Mississippian lower correlation line is base of Upper G. typicus conodont zone and upper correlation line is near top of Chesterian stage but basal Ely Limestone part of the overlap assemblage is also Chesterian in age see text
Seems odd to have forebulge jump so dramatically—how does this happen? Is the flexural interpretation wrong?
Seems that the forebulge isn’t moving smoothly east, right?
Other evidence of what happened? Mississippian shelf in SE CA subsided rapidly and stablized (kind of like what we saw in Ancestral Rockies). This incidentally suggests there was Antler material to the west...
So how extensive is this event (or events?). Some similarities to stuff in Canada, though note that Canadian allochthon is attenuated continental crust while no evidence of such material in Nevada.
Figure 6  Geotectonic features of the Antler orogen (Late Devonian–Early Mississippian), the Ancestral Rocky Mountains province (Pennsylvanian–Early Permian), and the Sonoma orogen (Late Permian–Early Triassic) of the North American Cordillera (allochthons of Antler and Sonoma age are combined, but note the uncertain continuity of tectonic trends along the trans-Idaho discontinuity of Figure 5). See text for discussion of Kootenay structural arc (KA) and remnants of Paleozoic arc assemblages in Quesnellia (Qu) and Stikinia (St). Key active faults: RMT, Devonian-Mississippian Roberts Mountains thrust; GCT, Permian-Triassic Golconda thrust; CCT, Permian-Triassic California-Coahuila transform. Gondwanan Mexico restored (after Dickinson & Lawton 2001a) to position before mid-Mesozoic opening of the Gulf of Mexico. Tintina and De-CS-FW-QC fault systems are Cenozoic structures. See Figure 5 for geographic legend.

Dickinson, Earth Plan Sci Rev., 2004

OK, so what is this event?
Detrital Zircon samples
- Smith and Gehrels, 1994
- Gehrels et al., 2000a

Linde et al., Geosphere, 2016
So there are some differences relative to what we usually think of the miogeocline in NV sampling: no 1.4 Ga, no Mazatzal
So there are some differences relative to what we usually think of the miogeocline in NV sampling: no 1.4 Ga, no Mazatzal
Overall, do we see these peaks at any time in W NAM? New plot is all but Ordovician from Tr–Neoproter. seds. Is the 2.1 Ga there? How is the 1.4 missing? Look in more detail...
So there are some differences relative to what we usually think of the miogeocline in NV sampling: no 1.4 Ga, no Mazatzal
Unclear how many of the same samples are in this Ordovician reference
Sonoman and younger exotic terranes. We will return to this as we explore the derivation from the central Laurentian craton; the Yavapai-Mazatzal terranes are similar in age to Archean terranes in the PRA region, including the Nova and Buffalo Head terranes (Hoffman, 1989; Ross, 1991; Villeneuve et al., 1993). Igneous bodies in the PRA region (Gehrels and Pecha, 2014) is shown. The map is after Thorsby (1950–2380 Ma), bamun (2321 Ma) and Hearne province; SU—Superior province; (1993). WY—Wyoming province; HE—Hearn province; MAJ—Mojavia.

The Peace River Arch region is outlined by the Peace River Arch basin (but their maps still show this thing just getting sediment from the far north). We will return to this as we explore the Sonoman and younger exotic terranes.

So there are some differences relative to what we usually think of the mioecline in NV sampling: no 1.4 Ga, no Mazatzal. Linde et al seem to want to make RMA off Peace River arch (but their maps still show this thing just getting sediment from the far north). We will return to this as we explore the Sonoman and younger exotic terranes.
For the moment, let’s assume that RMA isn’t too far travelled (we will explore the basis for this in a few days with zircons again). One idea is a west-facing subduction system...but where is the magmatic arc?
Contraction with minimal arc (only in far south) and extension in upper plate—slab rollback model
Contraction with minimal arc (only in far south) and extension in upper plate—slab rollback model
Contraction with minimal arc (only in far south) and extension in upper plate—slab rollback model