New U-Pb Detrital Zircon Geochronology From the Eocene San Jose Formation, Eastern San Juan Basin, Northwestern New Mexico

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The San Juan Basin (SJB) of northwest New Mexico has received a considerable amount of study focused on determining the timing of Laramide deformation, provenance, and basin-scale sediment dispersal trends from Jurassic-earliest Paleogene strata. However, little is known about the sources and driving mechanisms for deformation and erosion that resulted in the deposition of Eocene synorogenic strata of the San Jose Formation in the SJB. The San Jose Formation has been subdivided into four units that include: (1) the basal Cuba Mesa Member (sand- and gravel-dominated facies), (2) the overlying silt-dominated Regina Member, (3) the sand-dominated Llaves Member which appears to interfinger with the upper Regina Member, and (4) the youngest (sand and silt dominated) Tapicitos Member. Presented here are N=4 new detrital zircon samples (representing a total of n=769 new U-Pb detrital zircon ages) from each member of the San Jose Formation.

The basal Cuba Mesa Member of the San Jose Formation contains primary peak ages at 1693, 158, and 111 Ma, with secondary peaks at 1406, 231, and 188 Ma. The overlying Regina Member contains peak ages at 1689 and 185 Ma with secondary peaks at 1404 and 86 Ma. The Llaves Member has one primary peak age at 1708 Ma and secondary peaks at 162 and 96 Ma. The Tapicitos Member has primary peak ages at 1702, 163, and 66 Ma with secondary peaks at 1426 and 205 Ma. In addition to the peak ages in the Llaves and Tapicitos Member, these units also contain occurrences of ages that fall between 650-225 and 1200-1000 Ma. Zircons of this age were not present in the lower two members of the San Jose (Cuba Mesa and Regina Members). The youngest ages in all four samples from the San Jose fall between 95-65 Ma.

Detrital zircon ages that fall between 1700-1400 Ma overlap in age with the Mazatzal and Granite-Rhyolite Precambrian provinces and may represent detritus derived from local Laramide uplifts. Mesozoic ages (225-65 Ma) overlap with the Cordilleran arc and likely are recycled. Ages that fall between 1200-1000 Ma overlap with the Grenville province and are likely recycled from parts of the Sevier fold/thrust belt and Mogollon highlands. Although preliminary, U-Pb detrital zircon data from the San Jose Formation support a model where the basal Cuba Mesa and Regina members were derived largely from nearby basement Laramide uplifts, whereas the overlying Llaves and Tapicitos members were derived from these same Laramide uplifts as well as highlands in the Sevier fold/thrust belt and Mogollon highlands.

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