Science - Geospheres; Studies from University of Texas Austin in the Area of Geospheres Reported [Impact of Mexican Border Rift Structural Inheritance On Laramide Rivers of the Tornillo Basin, West Texas (Usa): Insights From Detrital Zircon Provenance]

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2023 NOV 24 (NewsRx) -- By a News Reporter-Staff News Editor at Science Letter -- Investigators discuss new findings in Science - Geospheres. According to news reporting originating in Austin, Texas, by NewsRx journalists, research stated, "Late Cretaceous to Eocene Laramide basement- involved shortening fragmented the Sevier and Mexican foreland basins. This resulted in a major drainage reorganization in response to the emerging topography of Laramide basement- cored uplifts and Mexican inverted Border rift basins."

Funders for this research include University of Texas-Austin Equinor Fellows Program, University of Texas-Austin **Bureau of Economic Geology** Quantitative Clastics Laboratory, Statoil/Equinor, UTChron laboratory, Chevron (Gulf) Centennial Professor Endowment.

The news reporters obtained a quote from the research from the University of Texas Austin, "This study presents new depth-profile detrital zircon U-Pb data (3679 ages from 28 samples) from Upper Cretaceous- Eocene fluvial strata of the Tornillo basin in west Texas to determine sedimentary provenance and reconstruct sediment dispersal through the U.S.-Mexico border region. Detrital zircon U-Pb data are dominated by Hauterivian-Coniacian (130-87 Ma;-20%) and Coniacian- Ypresian (87-52 Ma;-30%) ages that represent Cordilleran and Laramide arc magmatism, respectively. Subordinate age groups are Paleoproterozoic- Mesoproterozoic (1900-1300 Ma;-12%), Ectasian- Tonian (1300-900 Ma;-8%), Tonian- Pennsylvanian (900-300 Ma,-10%); Permian- Triassic (300-200 Ma;-8%), and Jurassic- Early Cretaceous (200-130 Ma;-11%). Detrital zircon maximum depositional ages provide new constraints on the chronostratigraphic framework of the Tornillo Group, the stratigraphic nature of the Cretaceous-Paleogene boundary, and the stratigraphic level of the Paleocene-Eocene thermal maximum. Depth-profile core rim age pairs yielded Paleoproterozoic- Mesoproterozoic and Jurassic cores with Cretaceous- Paleogene rims, which represent zircons derived from Laramide magmatic rocks that intruded Yavapai-Mazatzal basement and Cordilleran- Nazas magmatic rocks. Zircon grains with Ectasian-Tonian cores and Paleozoic rims likely represent Appalachian derived and/or Coahuila terrane zircons recycled from the inverted Mesozoic Bisbee basin and Chihuahua trough. These results demonstrate that fluvial strata in the Tornillo basin were sourced from Laramide and Cordilleran magmatic rocks, Yavapai-Mazatzal basement, and recycled Mexican Border rift sedimentary rocks in the southwest United States and northern Sonora, and these sediments were delivered via a large (>103-km long), axial trunk river. Additional recycled detritus from Mexican Border rift sedimentary rocks in the Chihuahua fold belt was delivered via transverse tributaries. This drainage reconstruction indicates that the Tornillo river flowed along an inversion flank drainage corridor adjacent to topography formed by the inverted Mexican Border rift."

According to the news reporters, the research concluded: "Therefore, inherited Mexican Border rift architecture represented a first order control on sediment routing to the Tornillo basin."

For more information on this research see: Impact of Mexican Border Rift Structural Inheritance On Laramide Rivers of the Tornillo Basin, West Texas (Usa): Insights From Detrital Zircon Provenance. Geosphere, 2023. Geosphere can be contacted at: Geological Soc Amer, Inc, PO Box 9140, Boulder, CO 80301-9140, USA.

Our news correspondents report that additional information may be obtained by contacting Cullen Kortyna, University of Texas Austin, Jackson School of Geosciences, Dept. of Geological Sciences, 2275 Speedway Stop C9000, Austin, TX 78712, United States. Additional authors for this research include Daniel F. Stockli, Timothy F. Lawton, Jacob A. Covault and Glenn R. Sharman.

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