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### **Extreme Wind Erosion in the Puna Plateau, Central Andes, NW Argentina**



Wind erosion is integral to the evolution of arid landscapes on Earth and Mars, but the nature of long-term wind erosion of bedrock is poorly understood compared to incision by rivers or glaciers. We describe the Salina del Fraile (SdF) depression in the Puna Plateau of the Central Andes, NW Argentina, as a landform excavated by wind over several million years.

Using structural cross sections and a compilation of chronostratigraphic ages, we rule out the hypothesis that the depression was created by transtensional tectonics. Dated remnant lacustrine and alluvial deposits in the floor of the depression constrain the rate and timing of erosion. Late Oligocene-Miocene compressional folding uplifted friable strata that were preferentially eroded, resulting in the high-relief (900 m) depression. Up to 1.95 km and an average of 1.05 km of strata were eroded during the last 8.2 to 17 Ma, at rates of 0.06 to 0.23 mm/yr. Although such magnitudes of wind erosion are extreme, the rates are similar to long-term averages reported in other regions. The SdF also contains kilometer-scale mesas and ridges with a smoothed morphology that we interpret as erosional remnants. These landforms are similar to megayardangs and erosional topography identified on the lower flanks of Mount Sharp, Gale crater, Mars. In such hyperarid landscapes characterized by lithologic heterogeneities, high-relief landforms can be generated and sustained by wind erosion, without significant fluvial or glacial incision.