

## **Excellent Shelf to Slope to Basin Floor Clinoform Outcrop Completely Exposed at La Jardinera, Jurassic Neuquén Basin, Argentina**

**Yuqian Gan<sup>1</sup>, Ron Steel<sup>1</sup>, and Cornel Olariu<sup>1</sup>**

<sup>1</sup>University of Texas at Austin

### **Abstract**

Basin margin clinoform, being the most widely presented geometry at passive basin margins, and typically illustrated on seismic data, it is not easy to observe its complete visage in outcrops due to the usually large (km-scale) size. In La Jardinera area in southern Neuquén Basin, Argentina, Jurassic clinoforms in the early post rift stage of the back-arc basin are exposed in a ~12 km x 15 km area. The fluvial deposits of Challaco Fm., shelf deposits of Las Lajas Fm., and slope and basin floor deposits of Los Molles Fm. can be mapped in outcrop and from satellite images, giving clear clinoform timelines correlated by sand bodies on the shelf, slope, and basin floor, and shelf mudstones interpreted as flooding surfaces and abandonment surface when sedimentation rate is low. Sandstone bodies on shelf, slope, and basin floor have characteristic facies that can be readily identified in the field to locate the relative water depth. The shelf deposits are dominated by fluvial and tidal facies with marine fossils and tracefossils. Shelf-edge deltas are often coarse-grained, sometimes incising the underlying slope mudstones and transit to gravity-driven deposits of high-density and low-density turbidites in slope channels. The slope channels appear to be lenticular in cross section but with variable facies. The geometry and fill of slope channels change depending on the location of the slope channel on the slope. Basin floor fan deposits are thick (>200 m) and extensive (horizontally correlatable on km-scale), and sit at the bottom of the circa. 300m tall clinoform with many erosional geometries suggesting sediment bypass. The complete exposed topset-foreset-bottomset of La Jardinera clinoforms offer an excellent outcrop example for facies and depositional environmental variations for basin margin clinoforms. The large outcrops of the basin margin clinoforms allow the observation of reservoir analog facies and architecture at different locations along the clinoforms profile. Some of the best (reservoir and trap) conditions are at the change of the gradients, below and above the shelf edge and at the base of slope to basin floor transition.