

## **Testing the Origins of Nonmarine Stratigraphic Sequences, Iglesia Basin, Northwest Argentina.**

Brian Ruskin

Cornell University, Department of Earth and Atmospheric Sciences

Ithaca, NY

[bgr9@cornell.edu](mailto:bgr9@cornell.edu)

The Iglesia Basin is a nonmarine Andean foreland basin consisting of approximately 3.5 km of Tertiary strata unconformably overlying Paleozoic basement. Best described as a wedge-top basin, Iglesia Basin is located in NW Argentina at S 30-31°, W 69-70° between the Frontal Cordillera and Precordillera fold-thrust belt. Interpretations of seismic reflection profiles and field reconnaissance have suggested regionally-correlative stratigraphic sequences. Additionally, radiometric and magnetostratigraphic data constrain deposition between approximately 17 and 4 Ma. However, the fundamental question concerning the origin of the sequences remains unanswered. Prior to this work, hypotheses about the factors at play, notably tectonism and climate change, remained untested, and fieldwork provided only localized information. The present study supplies a broadened perspective of basin lithofacies and independent constraints of discharge history (a proxy for climate) and of intrabasinal folding. The nature of unconformities and paleosol development were studied as a means of locating and assessing the continuity of sequence boundaries in the field. Volcanic material has been submitted for Ar-Ar dating, and will provide key chronologic tie lines among several sections, allowing for regional environmental interpretation. To quantify the climatic signal through time, carbonate samples, primarily from pedogenic units, were analyzed for carbon-13 and oxygen-18 signatures, which in combination provide proxy evidence of climatic fluctuations. Additionally, petrographic study of these samples provides information about the generalities and complications of the depositional environments.