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Paper No. 241-2

Presentation Time: 8:15 AM

FILLING THE GAP: NEW TITHONIAN-EARLY CRETACEOUS DATA FROM THE NEUQUEN BASIN, ARGENTINE ANDES (Invited Presentation)

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The Geological Time Scale for the Phanerozoic has one of its last geochronological gaps in the Early Cretaceous interval, including the base of the Berriasian (*aka* the J/K boundary) where no precise radio-isotopic ages are available. Up to now, the global 'standard' Early Cretaceous stages are mainly based on stratigraphic sections in the Mediterranean Province of the Tethys, and are mostly defined by ammonite biostratigraphy and calcareous nannofossil bioevents that have been calibrated with the M sequence of magnetic polarity chrons. Presently, the base of the Cretaceous is defined by the explosion of globular forms of the microfossil *Calpionella alpina*, and the calcareous nannofossils and ammonites are now considered secondary markers.

The Neuquén Basin is a retro-arc basin developed in a normal subduction segment at the foothills of the southern Central Andes. Laterally continuous outcrops of marine sedimentary rocks with an abundant fossil record, combined with interbedded tuffaceous layers make the basin an excellent site for stratigraphical, paleontological, and radio-isotopic studies. The Late Jurassic–Early Cretaceous magmatic activity along the arc was clearly episodic with pulses that peaked in early Tithonian, middle–late Berriasian and Hauterivian times.

The duration of the Tithonian up to the Hauterivian stages are presently under much debate, with large discrepancies between the numerical ages of the International Chronostratigraphic Chart 2018/v8 and the data provided by studies performed recently in the Andes and also in the Tethys. We present here high precision CA-ID TIMS Tithonian–Early Cretaceous dates combined with biostratigraphic data provided by ammonites, calcareous nannofossils and calpionellids. We also present an astronomical calibration to better constrain the durations of the Valanginian and the Hauterivian stages, constrained biostratigraphically by ammonites and calcareous nannofossils which correlate with the 'standard' sequence of the Tethyan Realm. These new data show significant differences not only in the absolute ages of the stage boundaries, 5 million years younger for the base of the Cretaceous (140 Ma) and 3 million years younger for the base of the Barremian (126 Ma), but also in the duration of each stage.

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Wednesday, 7 November 2018: 8:00 AM-12:00 PM

[Sagamore Ballroom 7 \(Indiana Convention Center\)](#)

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