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# Dynamic Versus flexural Controls of Late Cretaceous Western Interior Basin, USA

LIU Shaofeng[1,*], Dag NUMMEDAL[2] and LIU Lijun[3]

*1 State Key Laboratory of Geological Processes and Mineral Resources, China University of Geosciences (Beijing), Beijing 100083, China*
*2 Colorado Energy Research Institute, Colorado School of Mines, Golden, Colorado 80401, USA*
*3 Department of Geology, University of Illinois at Urbana-Champaig, Urbana, IL 61801-2939, USA*

The United States Cretaceous Western Interior Basin has long been considered a foreland basin, driven by the Sevier thrust and associated basin sediment loads. However, flexural studies demonstrate that this effect exists only within a narrow band in front of the thrust belt. Most of the basin appears to be due to mantle flow-induced dynamic subsidence associated with Farallon plate subduction. The loci of maximum rates of this dynamic subsidence moved eastward from ~98 to 74 Ma in phase with the west-to-east passage of the Farallon slab, as reconstructed from tomography based on quantitative inverse models. These new backstripped subsidence data reveal the dynamic-topography driven nature of the Western Interior Basin and allow a rigorous testing of existing subduction models. Furthermore, regional variations in subsidence rates suggest a possible deficit of negative buoyancy (mantle loading) inside the slab beneath Colorado, supporting the hypothesis that the thickened slab represents a subducted oceanic plateau. This work documents how the Cretaceous stratigraphy records the timing, patterns and position of underlying mantle processes during Farallon slab subduction. The new data also reveal patterns indicative of the commencement of the Laramide orogeny in the western United States.

**Key words**: Western Interior Basin, flexure, dynamic subsidence, Farallon slab, subduction

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* Corresponding author. E-mail: shaofeng@cugb.edu.cn

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