

**Chemostratigraphic carbon stable isotope data from Cretaceous long-line drill cores along the eastern margin of the Western Interior Basin**

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The following provides a summary of published organic  $\delta^{13}\text{C}$  ( $\delta^{13}\text{C}_{\text{org}}$ ) data used in the chemostratigraphic studies of three Cretaceous long-line drill cores (i.e., Andrzejewski et al., 2022). The three cores (KGS Gaydusek #1, KGS Kenyon #1, and KGS Jones #1) were collected from northern and central Kansas and include strata from the Kiowa, Dakota, Graneros, and Greenhorn formations that were deposited along the eastern cratonic margin of the Western Interior Seaway (WIS). The high-resolution  $\delta^{13}\text{C}_{\text{org}}$  profiles reveal records of Albian-Cenomanian OAE1d, the Mid-Cenomanian Event (MCE), and Cenomanian-Turonian OAE2, which can be used to improve both regional and global correlations for the Cretaceous units analyzed in this study. Furthermore, they provide insight into the regional dynamics of transgressive and regressive cycles of the WIS along the eastern cratonic margin.

The three cores (KGS Gaydusek #1, KGS Kenyon #1, and KGS Jones #1) are 2" in diameter and were collected by the Kansas Geological Survey (KGS) using an Acker Soilmax drill. Latitude and longitude for each core is listed using NAD83 projection: KGS Gaydusek #1 (39.9834438, -97.1996876), KGS Kenyon #1 (39.6835774, -97.7091471) and KGS Jones #1 (39.2184054, -98.1737579). The location of each core is shown in Figure 1. Lithologic descriptions of each core can be found in Macfarlane et al., 1994; Joeckel et al., 2008; Morath et al., 2015.; Andrzejewski and Kalbas, in prep). Borehole gamma ray logs conducted by the KGS are available online for each core through public access of the oil and gas well database library (<https://www.kgs.ku.edu/PRS/petroDB.html>).

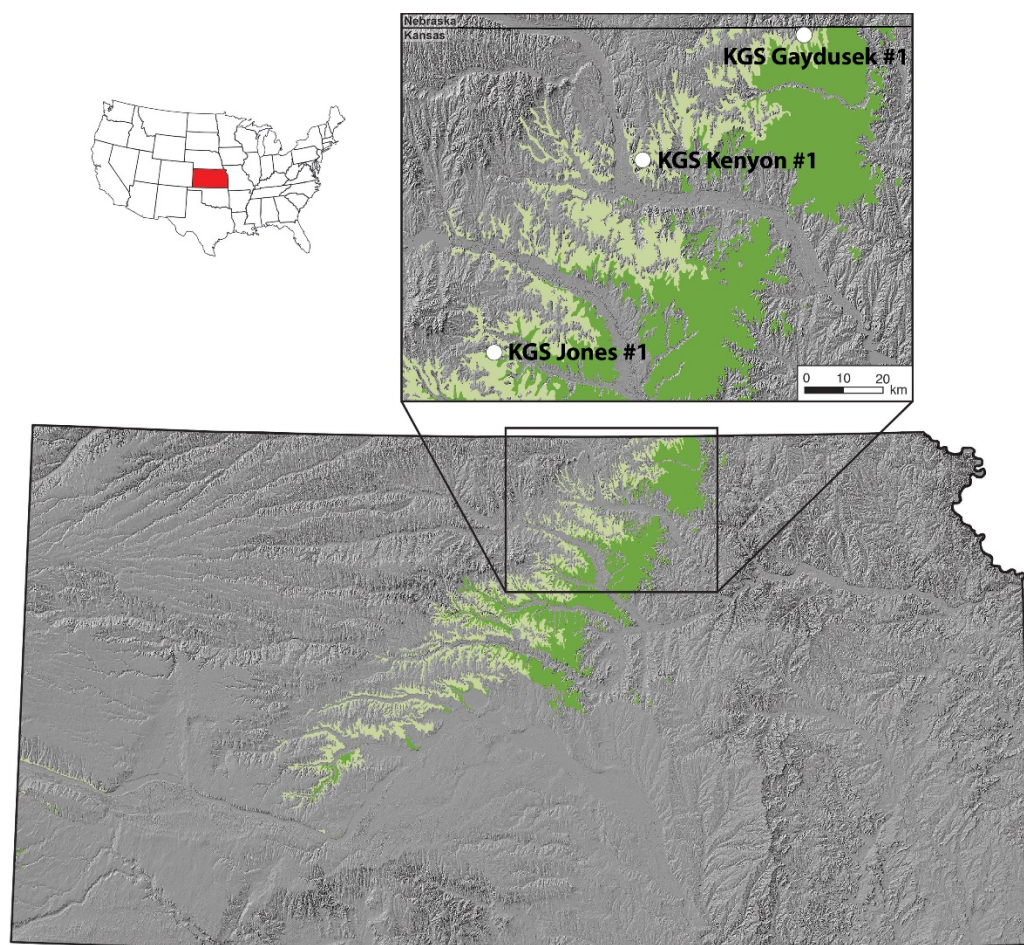


Figure 1: Extent of surface exposure of Cretaceous units analyzed in this study with the addition of the location of the three long-line drill cores (KGS Gaydusek #1, KGS Kenyon #1, and KGS Jones #1). Dark green (Dakota Formation) and light green (Graneros Shale and Greenhorn Limestone) coloring represents approximate surface exposure of Cretaceous units analyzed in this study.

Bulk samples were collected from each core at an interval of 30 cm in an effort to develop high-resolution organic carbon isotope chemostratigraphic profiles for each core. Chemostratigraphic profiles span the following depths for each core: KGS Gaydusek #1, 21.1–235 ft, KGS Kenyon #1, 15.1–208.8 ft, and KGS Jones #1, 12.5–223 ft. Core samples consist of approximately 1 g of powdered sample; they were decarbonated using 0.5M HCl for 24 hours

until the sample no longer reacted to additional HCl. Samples were then decanted and rinsed with DI water until the supernatant reached a neutral pH. Rinsed samples were then dried at 45 °C for 24–48 h. Dried powders were then powdered and homogenized using a ruby mortar and pestle. Approximately 0.3–2 mg of each sample were then combusted in a Costech Elemental Analyzer, with the resulting CO<sub>2</sub> analyzed with a ThermoFinnigan MAT253 continuous-flow isotope ratio mass spectrometer. The resulting  $\delta^{13}\text{C}_{\text{org}}$  values, carbon weight %, and sample depths (listed in feet and meters) for each core are listed in the Excel file that accompanies this report. All analyses were conducted at the Keck Paleoenvironmental and Environmental Stable Isotope Lab at the University of Kansas. Samples were corrected using in-house and international standards (USGS 24, IAEA 600, DORM, and IAEA C6) and reported relative to V-PDB with a reported accuracy of  $\pm 0.1\%$ .

Special thanks to Dr. P. Allen MacFarlane for the scientific vision to collect the KGS cores; to Dr. Laura Murphy, Arlo McKee, Dr. Celina Suarez, Dr. Alvin Bonilla, Dr. James Golab, and Bridget Sanderson for the stable isotope sample preparation; and to Greg Cane and Bruce Barnett for overseeing the analyses at the Keck Paleoenvironmental and Environmental Stable Isotope Laboratory at the University of Kansas.

#### Disclaimer

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