

# 23-6 - DETRITAL ZIRCON AGE ESTIMATES OF SELECT UPPER CRETACEOUS AND NEOGENE SEDIMENTARY ROCKS, DENVER BASIN AND NORTHEASTERN, COLORADO



Thursday, 25 May 2023



9:45 AM - 10:05 AM



Room 304-306 (Lory Student Center)

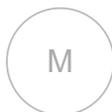
## Abstract

The Colorado Geological Survey (CGS) collects and evaluates geochronologic data to estimate the ages of geologic units to enhance the geologic knowledge of the state and for use in geologic hazard investigations, hydrogeologic studies, geologic mapping, and mineral resource evaluations. Recent CGS investigations within the Denver Basin and northeastern Colorado included the analyses of select samples using detrital zircon U-Pb geochronology to provide age estimates and for provenance analysis. Samples from the Late Cretaceous Fox Hills Sandstone, the Late Eocene Castle Rock Conglomerate, and the Miocene-Pliocene Ogallala Formation were analyzed using these methods. Two samples from the upper part of the Fox Hills Sandstone (collected near Limon, CO) yielded youngest single-grain (YSG) ages of  $74 \pm 2$  Ma and  $67 \pm 3$  Ma with youngest-age populations (YAP) of  $76.6 \pm 1.2$  Ma (mean-square weighted deviation [MSWD] = 0.40; N = 3) and  $72.2 \pm 1.0$  Ma (MSWD = 0.75; N = 9), respectively. Two samples from the Castle Rock Conglomerate (collected from Castlewood Canyon in Douglas County), collected near the base and upper part of the unit, contain YSG ages of  $33.1 \pm 2$  Ma and  $36.7 \pm 2.5$  Ma, while the YAP is  $36.5 \pm 0.85$  Ma (MSWD= 0.96; N=6) and  $37.4 \pm 1.2$  Ma (MSWD= 0.28; N=5), respectively. The upper part of the Ogallala Formation (collected from Cedar Point near Limon, CO) yielded a YSG age of  $23 \pm 1$  Ma (MSWD = 1.05; N = 3), and a YAP of  $29.3 \pm 1.1$  Ma. The YAPs for the units are generally in accordance with other published detrital zircon ages in the area; however, the 33.1 Ma YSG from the Castle Rock Conglomerate is younger than other published ages and may place part of the unit, which is suspected to be Late Eocene in age, into the lower Oligocene. Similarly, the  $67 \pm 3$  Ma YSG age from the Fox Hills Sandstone near Limon, may straddle the K-Pg boundary. Additional dating of the Castle Rock Conglomerate and upper part of the Fox Hills Sandstone is warranted to refine the ages of these formations and to better define their contacts. General provenance analysis using kernel density estimation plots of these data is ongoing and will be provided in the session.

Geological Society of America Abstracts with Programs. Vol. 55, No. 5, 2023  
doi: 10.1130/abs/2023RM-387863

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