

## **Revised Zircon and Spheue Ages from the Central Wasatch, Utah Intrusive Complex: Refining the Magmatic-Hydrothermal History of the Region**

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The intrusive rocks of the central Wasatch Range, Utah, lie within the Early Proterozoic Unita-Cortes Anticline. Mid-Tertiary crustal extension perpendicular to the Unita Arch resulted in the emplacement of Eocene to Oligocene stocks in an E-trending batholith. The emplacement depth of the stocks increases and their ages decrease to the west. The central Wasatch intrusive units are calc-alkaline to locally alkaline with trace and major element variations explained by different residence times within the crust and therefore variable crystal fractionation and crustal assimilation.

The youngest intrusive unit is the Little Cottonwood stock, previously dated by various methods to be between 33.3 and 24.9 Ma. The eastern stocks, comprising the Mayflower, Valeo, Flagstaff, and Pinecreek stocks, are the oldest intrusions previously reported to have ages that overlap at 41–38 Ma. Our new zircon and sphene U/Pb ages were obtained using an Excimer 193 laser and an Agilent quadropole ICP-MS. Most of our zircon U/Pb ages are younger than previously reported ages with the exception of the Keetley Volcanics and the Park Premier stock. The eastern stocks, which were previously thought to all be around 42 to 38 Ma, were dated to be between 35.5 and 34.9 Ma. Little Cottonwood, Alta, and Clayton Peak stocks were all 0.5 to 1 m.y. younger than the previous range of ages. These new ages indicate that magma emplacement in the Wasatch mountains are all younger than the 38 Ma Bingham Canyon intrusions.

The source of the Keetley Volcanics has been thought to be the Park Premier or Alta stocks, as these were the closest in age to the volcanics. The Park Premier stock reportedly intrudes the Keetley Volcanics. However, our zircon ages suggest that the Park Premier and Alta stocks are in fact younger than the Keetley volcanics. It is therefore more likely that the Keetley volcanics were sourced from one or more of the older eastern stocks such as Valeo, Flagstaff, Pine Creek, or Clayton Peak.

Sphene from the Little Cottonwood stock, Valeo stock, Alta stock, and the Park Premier stock have been U/Pb dated. The ages obtained in the western stocks (Little Cottonwood and Alta) are within error of our zircon ages. However, the sphene ages obtained for the eastern stocks (Park Premier and Valeo stocks) are significantly younger. Late stage hydrothermal activity may have reset the sphene U-Pb ages in the eastern stocks.