ABSTRACT

TITLE:	Age and Origin of the Mount Sneffels Stock, Western San Juan Mountains, Colorado
AUTHOR(S):	Lewis, Kyle; Gonzales, David
PRESENTED AT:	2015 Undergraduate Research and Creative Activities Symposium, Fort Lewis College

ABSTRACT: Intermediate to mafic intrusive rocks are exposed in the Mount Sneffels stock in the western San Juan Mountains, Colorado. Debate over the timing of pluton emplacement in previous studies impeded an understanding of how this pluton fit into the regional magmatic history. Detailed field studies revealed that the pluton intruded adjacent Oligocene volcanic rocks of the Southern Rocky Mountain volcanic field. However, a previous K/Ar and fission track age of ~32 Ma suggested that the stock was older than the ~28 Ma volcanic rocks. A new U/Pb zircon age determination constrains the emplacement of this stock to ~27 Ma, resolving the previous age contradiction. This U/Pb zircon age indicates that the Mount Sneffels stock is the oldest Oligocene mafic intrusion in the western San Juan Mountains and was emplaced shortly after the formation of multiple calderas from ~28-27 Ma. This temporal and spatial association with major calderas supports the thesis that mantle-derived basaltic magmas were temporally and genetically related to caldera formation. Isotopic concentrations of 87Sr/86Sr (0.7059) and epsilon Nd (-6.2) are consistent with existing data which suggest that the Mount Sneffels stock was derived from lithospheric mantle melts that interacted with the lower crust. This also supports previously proposed tectonic-magmatic models for magma production of the Southern Rocky Mountain volcanic field during the Oligocene. Continued isotopic and geochronological study of intrusive and extrusive rocks of the region will further constrain the origins of voluminous volcanism in this intracontinental setting, a topic of current petrologic debate.