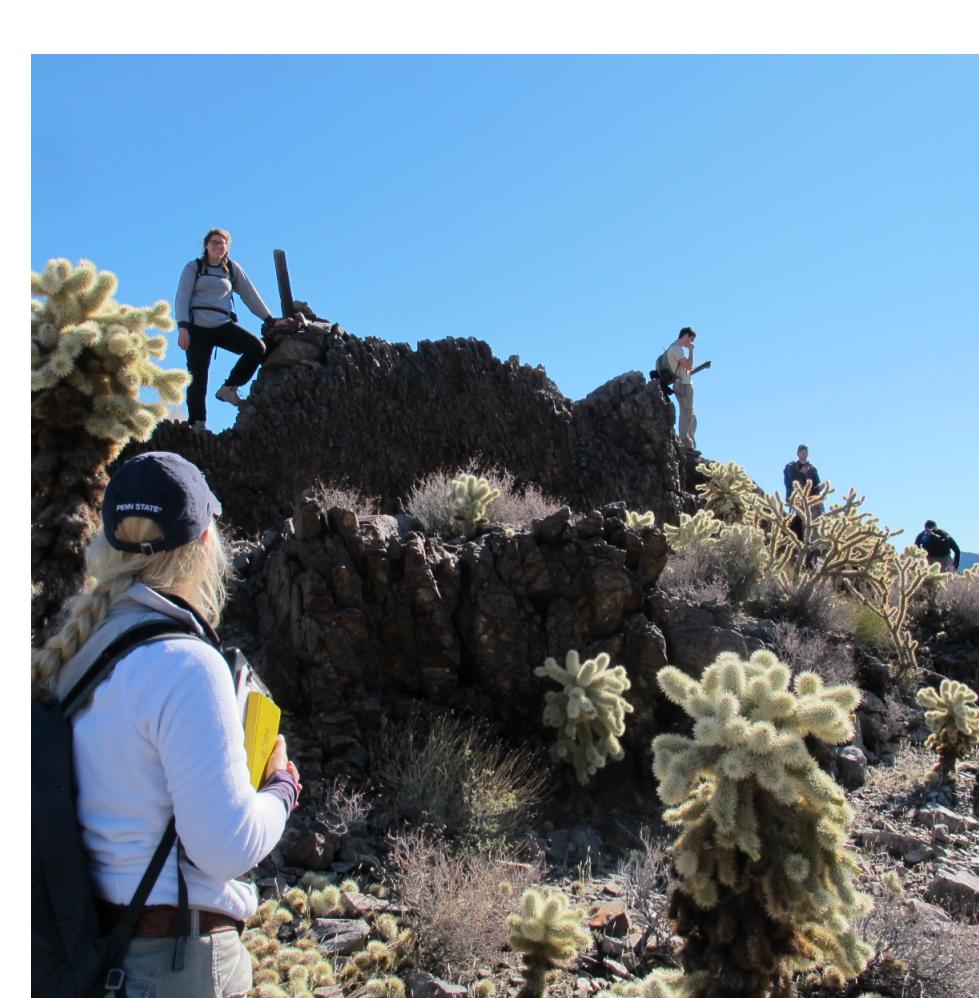


## INTRODUCTION

Meadow Creek basin (MCB; southern Black Mountains AZ), 4 km E of the caldera of the 18.8 Ma Peach Spring Tuff (PST) supereruption (Ferguson et al 2013), reveals a 3 m.y record of the aftermath of that eruption. Building on previous work in the area (Ransome 1923, Thorson 1971, Liggett & Childs 1982; Ferguson pers. com.), NSF-REU undergrads mapped a 12 km<sup>2</sup> area within MCB and expanded their spatial scope through remote sensing (Schwat et al, Helfrich et al, Thompson et al 2016). Students further investigated the sequence with optical petrography and analysis by XRF, SEM-EDS, and LA-ICPMS.

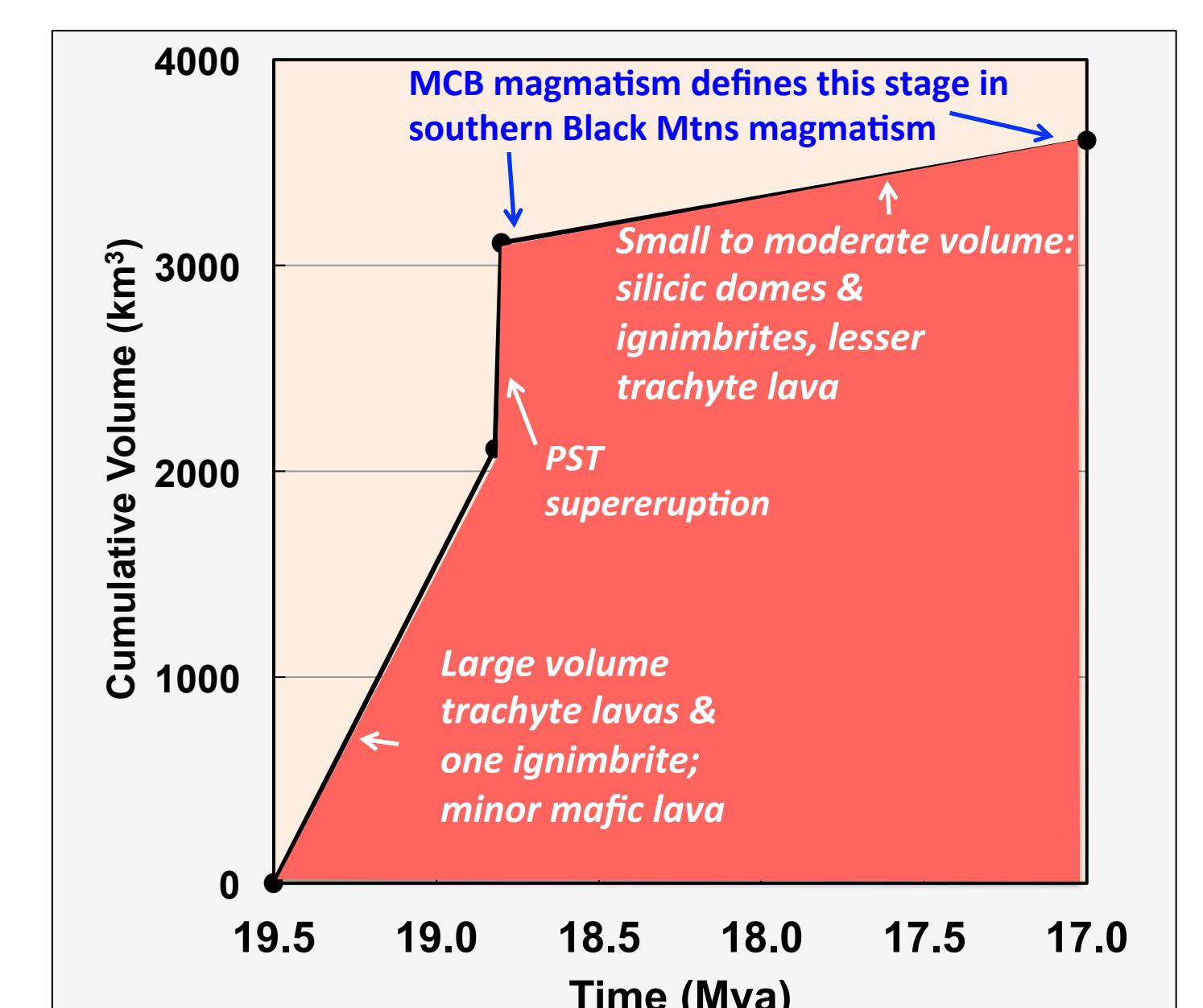
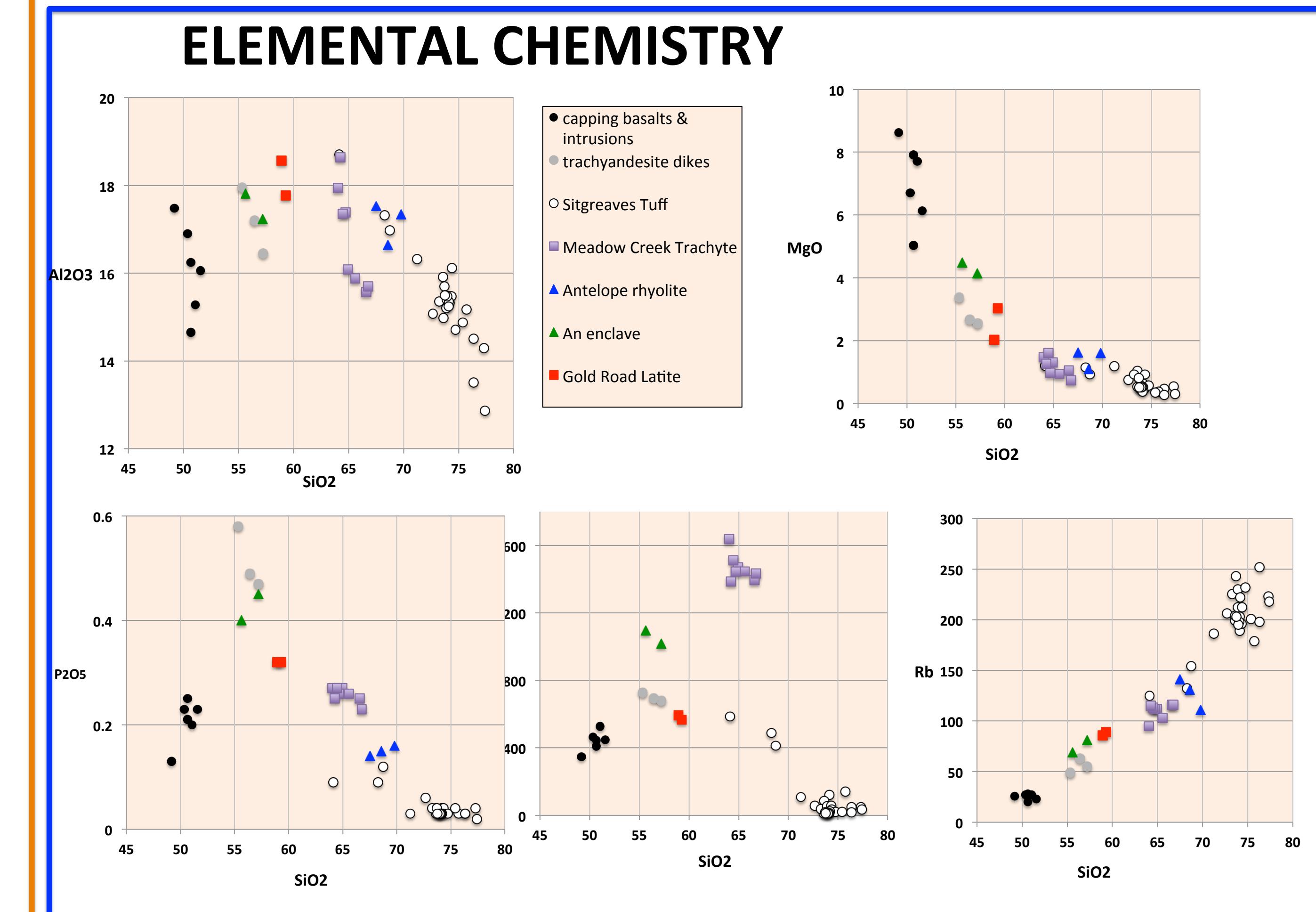
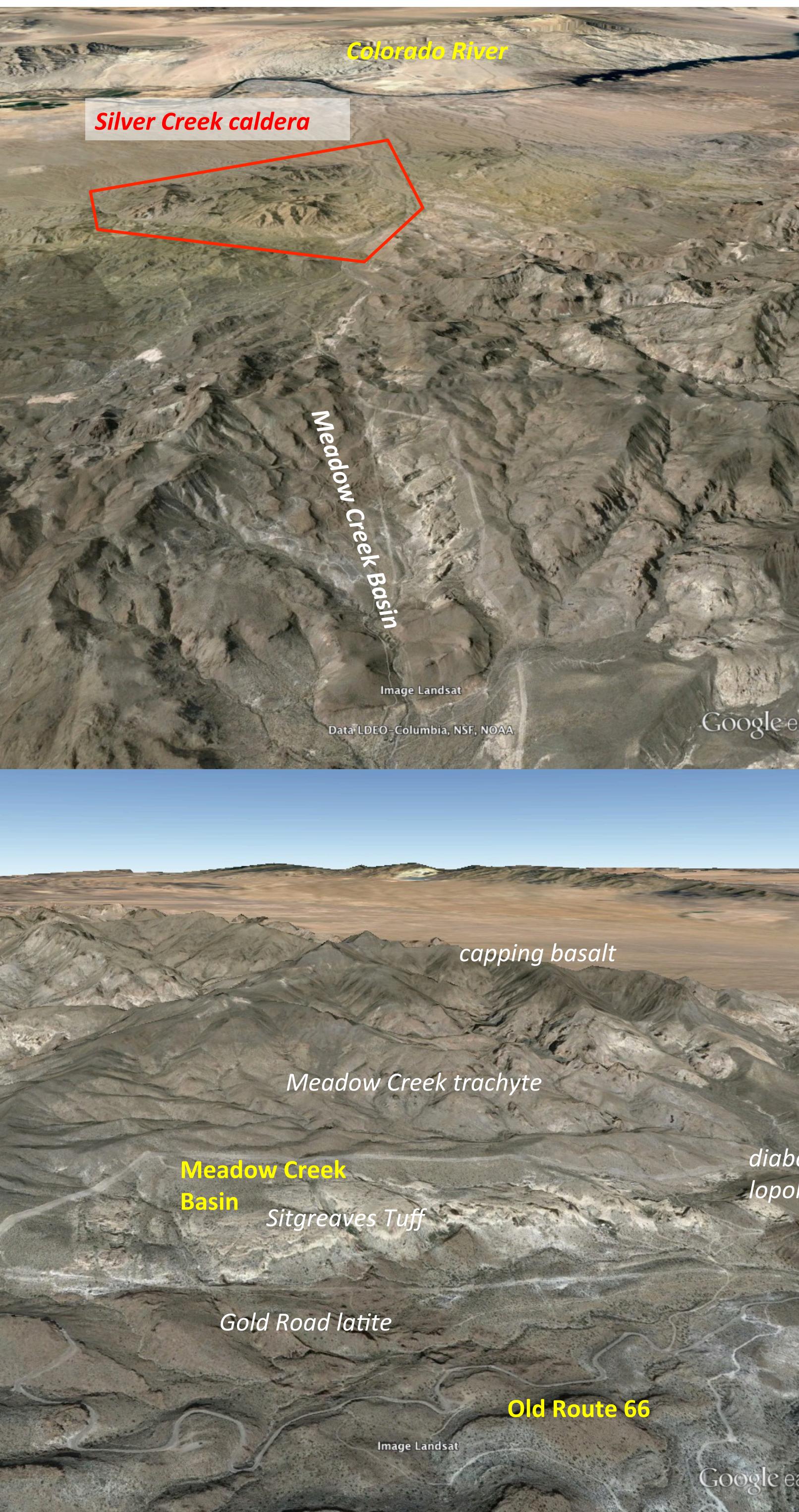
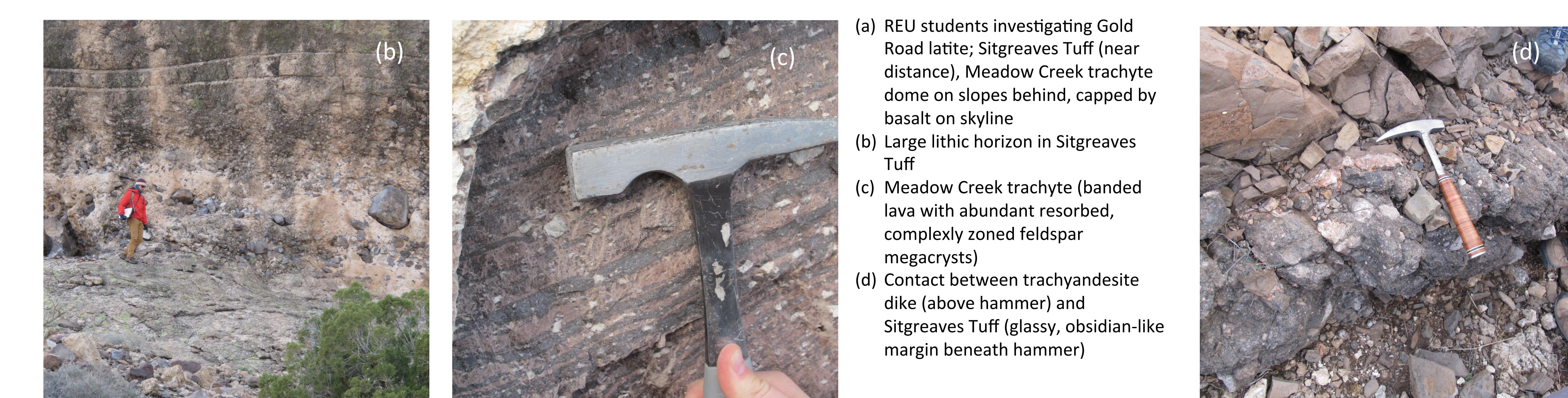
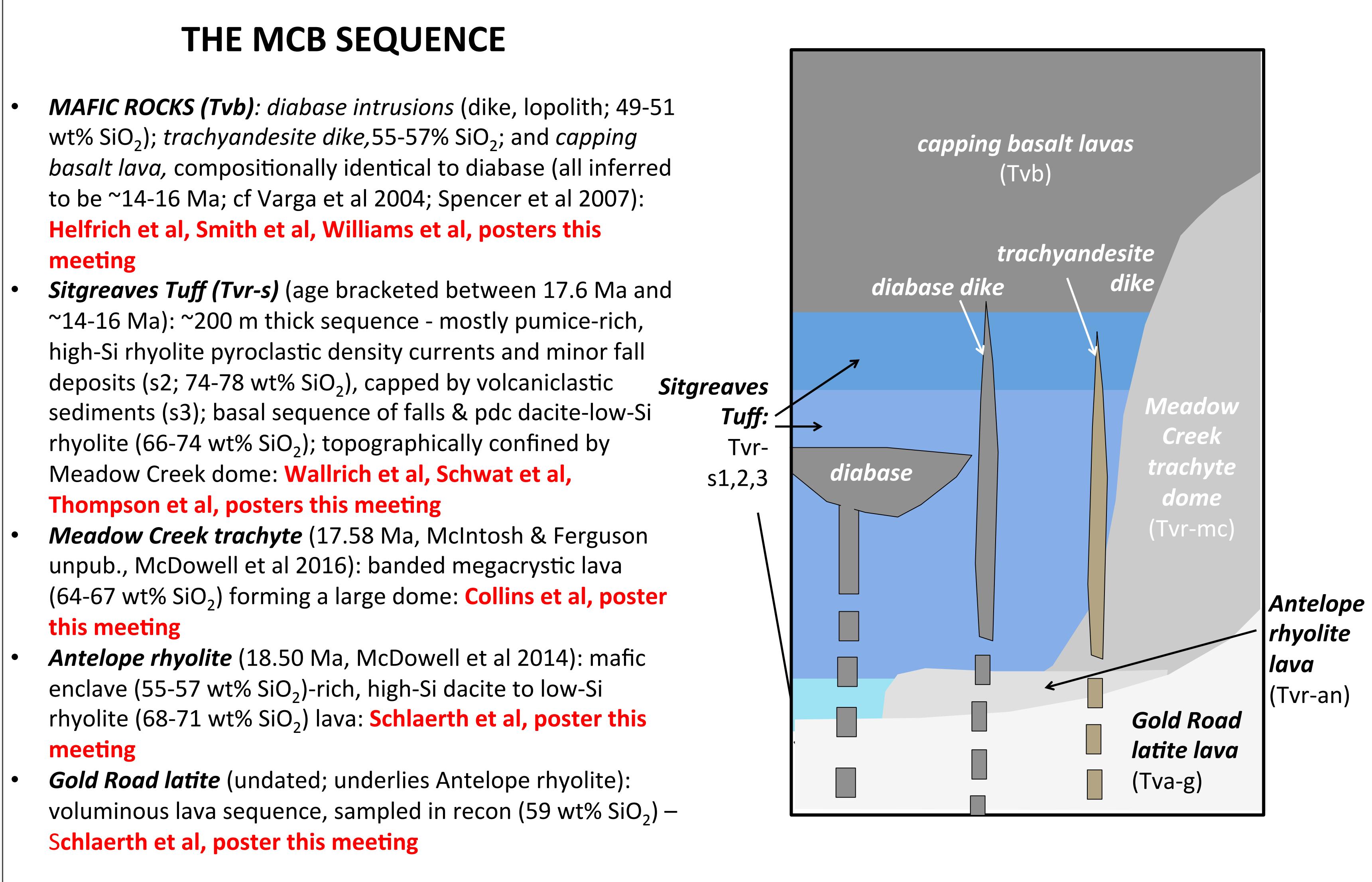
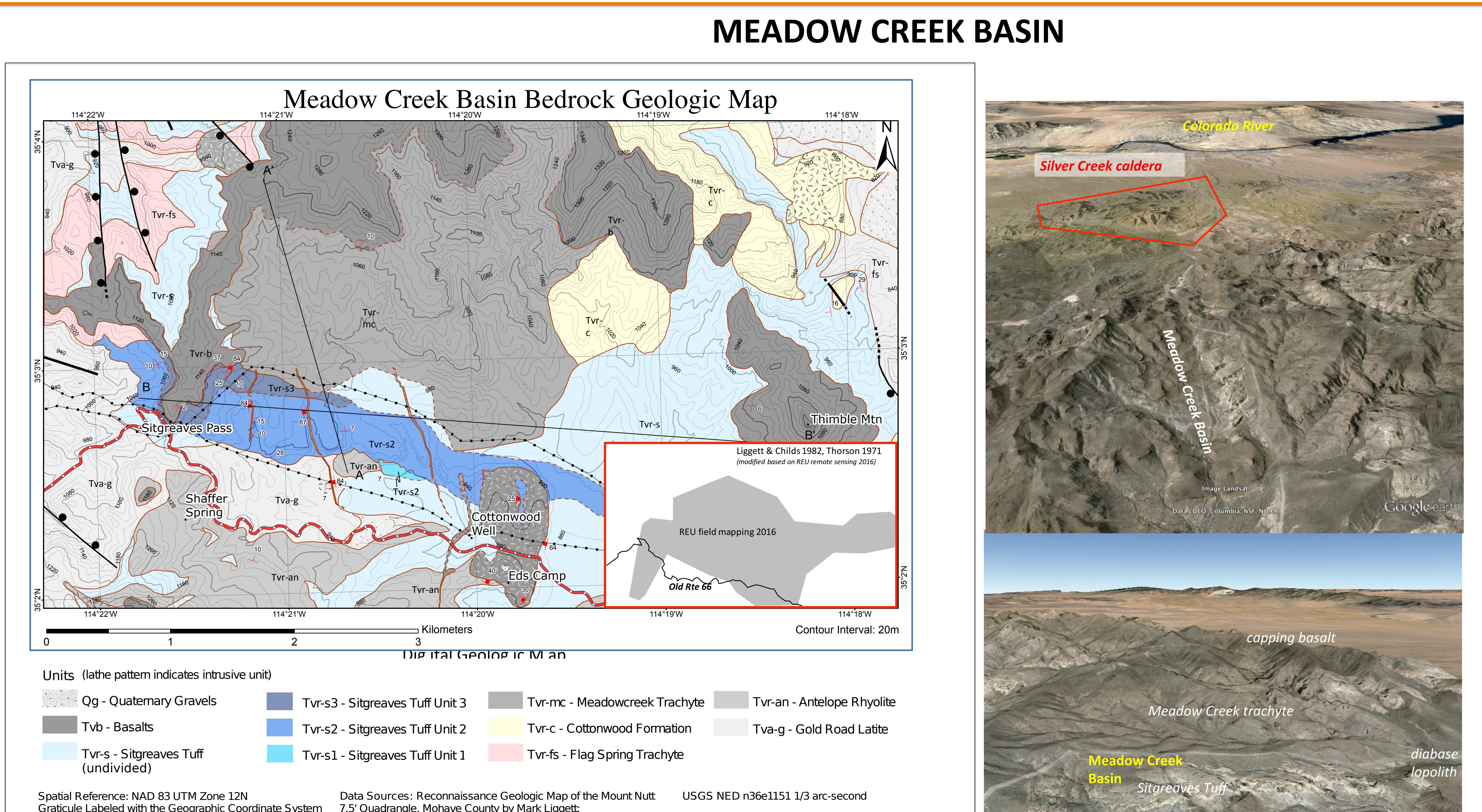
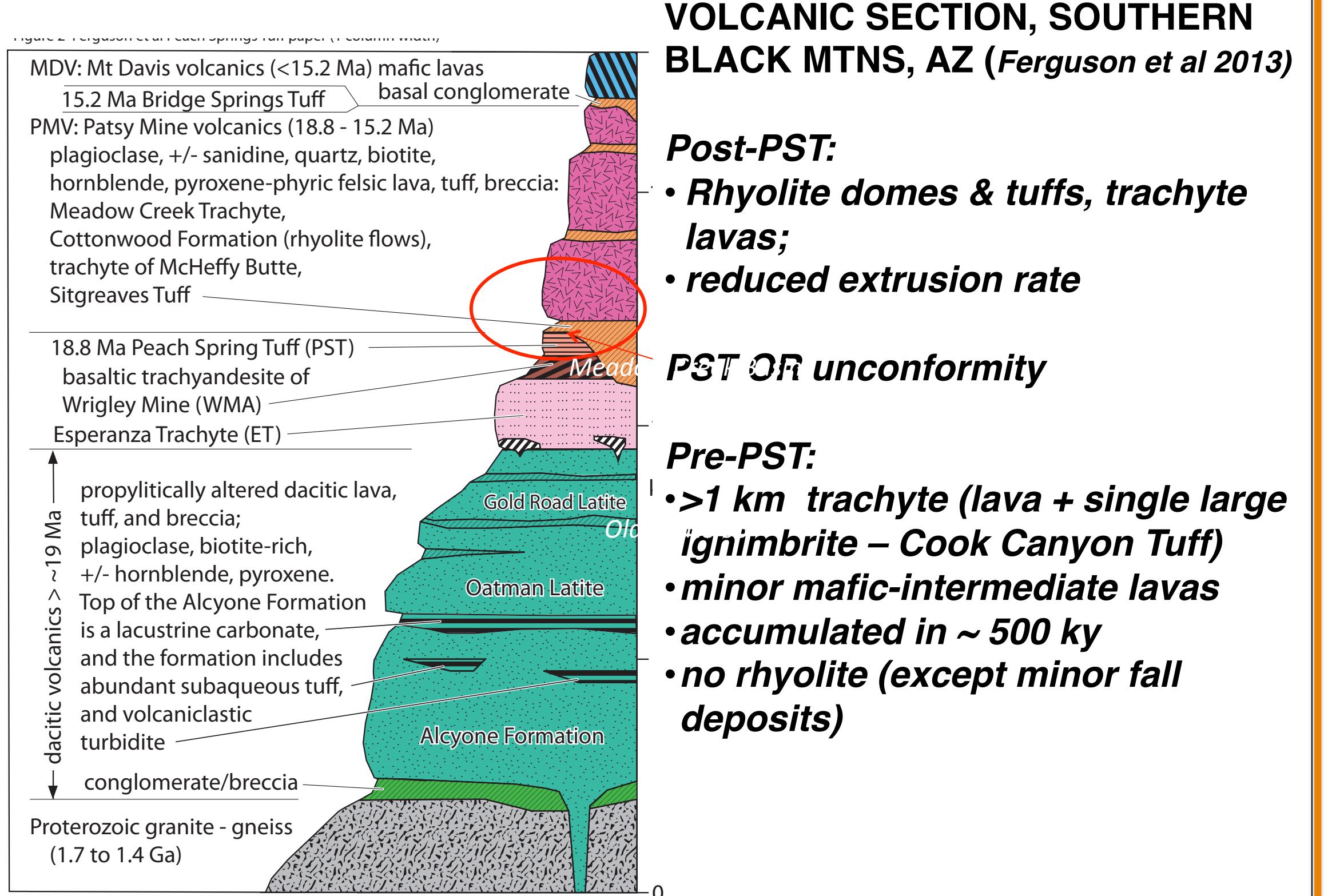
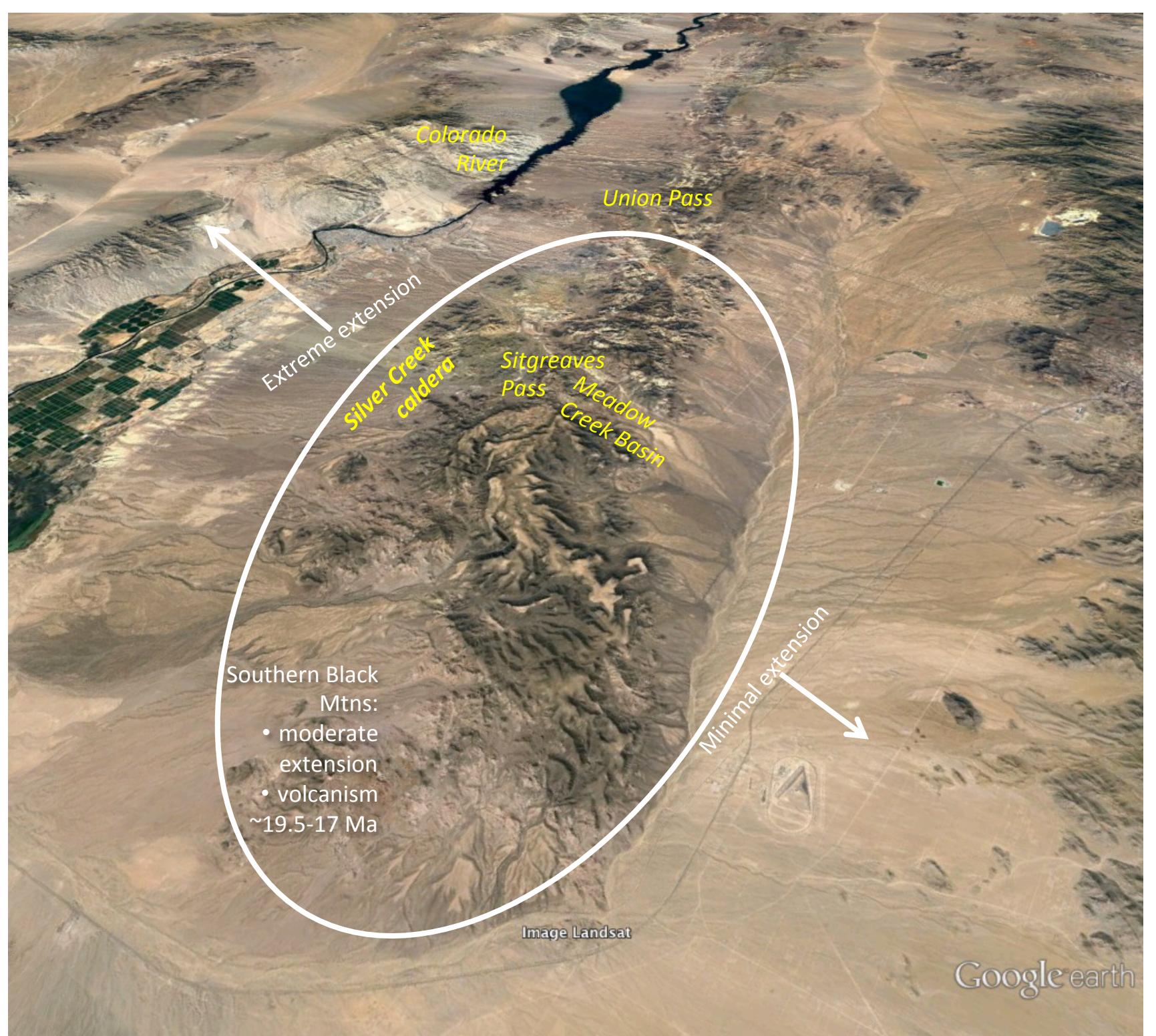
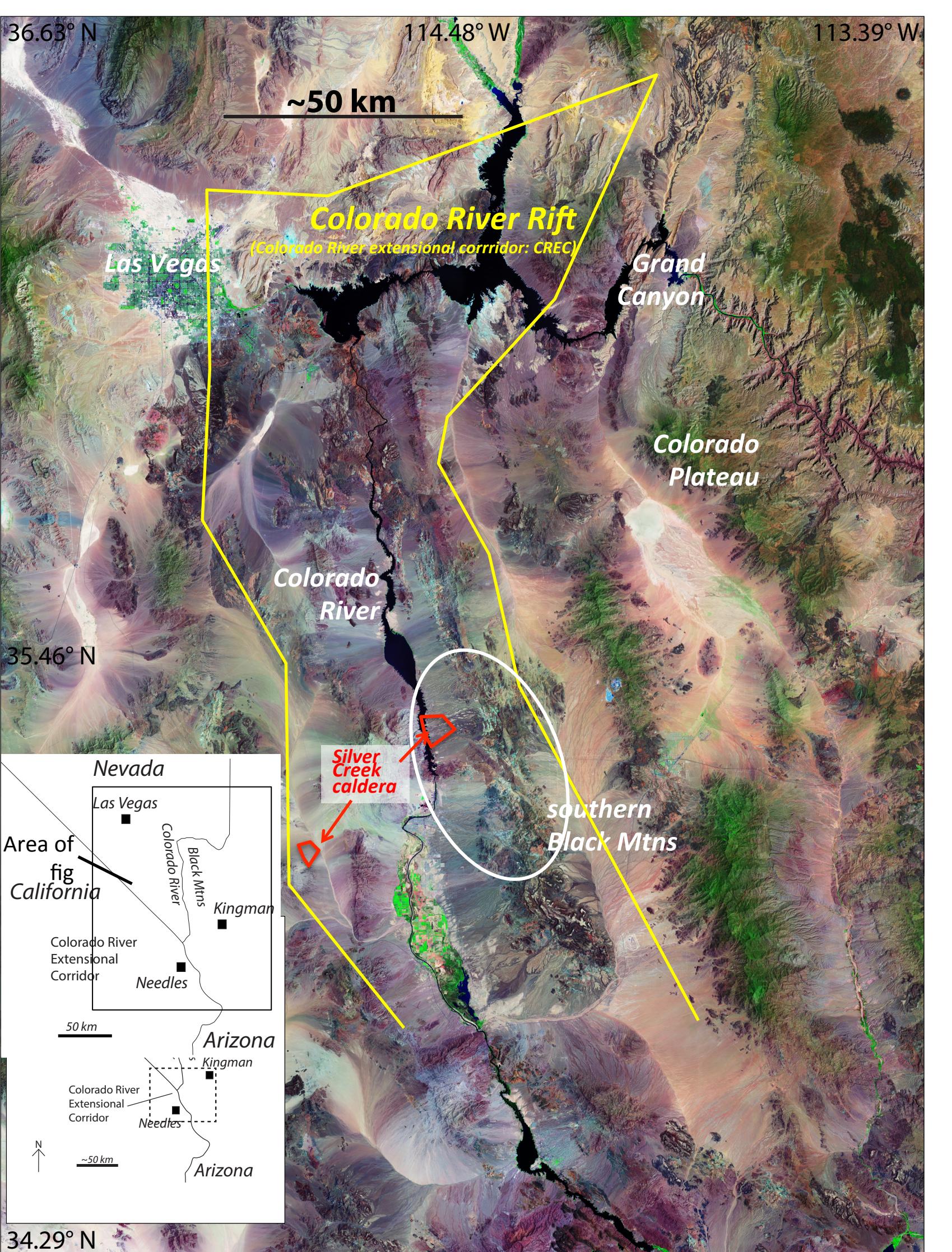


# GEOLOGY OF MEADOW CREEK BASIN, SOUTHERN BLACK MOUNTAINS, ARIZONA: RECORD OF POST-SUPERERUPTION VOLCANISM (REU PROJECT, 2016)

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## CONTEXT: SILVER CREEK CALDERA, SOUTHERN BLACK MOUNTAINS, & COLORADO RIVER EXTENSIONAL CORRIDOR



## CONCLUSIONS & IMPLICATIONS

- Antelope lava, rich in magmatic enclaves, may mark continuing mafic input into silicic chambers as postulated for triggering of the PST eruption (Schlaerth et al 2016; Pamukcu et al 2013).
- Meadow Creek trachyte, with its disequilibrium assemblage of diverse, reacted megacryst/phenocryst assemblage, appears to document entrainment of crystal mush in ascending magma (Collins et al 2016) – consistent with zircon + whole-rock isotope data (McDowell et al 2016) that requires contrasting magmas and crystal cargoes.
- Sitgreaves Tuff represents the largest post-PST explosive episode in the southern Black Mountains; the dominant high-Si rhyolite is the most evolved evolved magma yet recognized in this region (Wallrich et al 2016).
- The diabase intrusions and capping lavas reflect a major change in style and composition of magmatism, from high-alkalic calc-alkalic and mostly intermediate to felsic compositions mafic tholeiitic (Smith et al 2016).
- Where dikes intrude Sitgreaves Tuff, tuff is highly indurated and commonly vitrophyric, reflecting welding that resulted from heating above the glass transition (Williams et al 2016).

The MCB sequence reveals distinct changes in magmatism following PST eruption (Claiborne et al 2016), e.g.: (1) Eruptive flux diminished; (2) Rhyolite, rare pre-PST, became dominant; (3) Evidence for open-system processes involving mafic magma increased, but erupted magmas were cooler and more hydrous

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