154-4 Preliminary Results of Geologic Mapping of the Durwood, Alder Creek, and Rincon Roof Pendants, Sierra Nevada Batholith (Fairview Quadrangle), Tulare County, California

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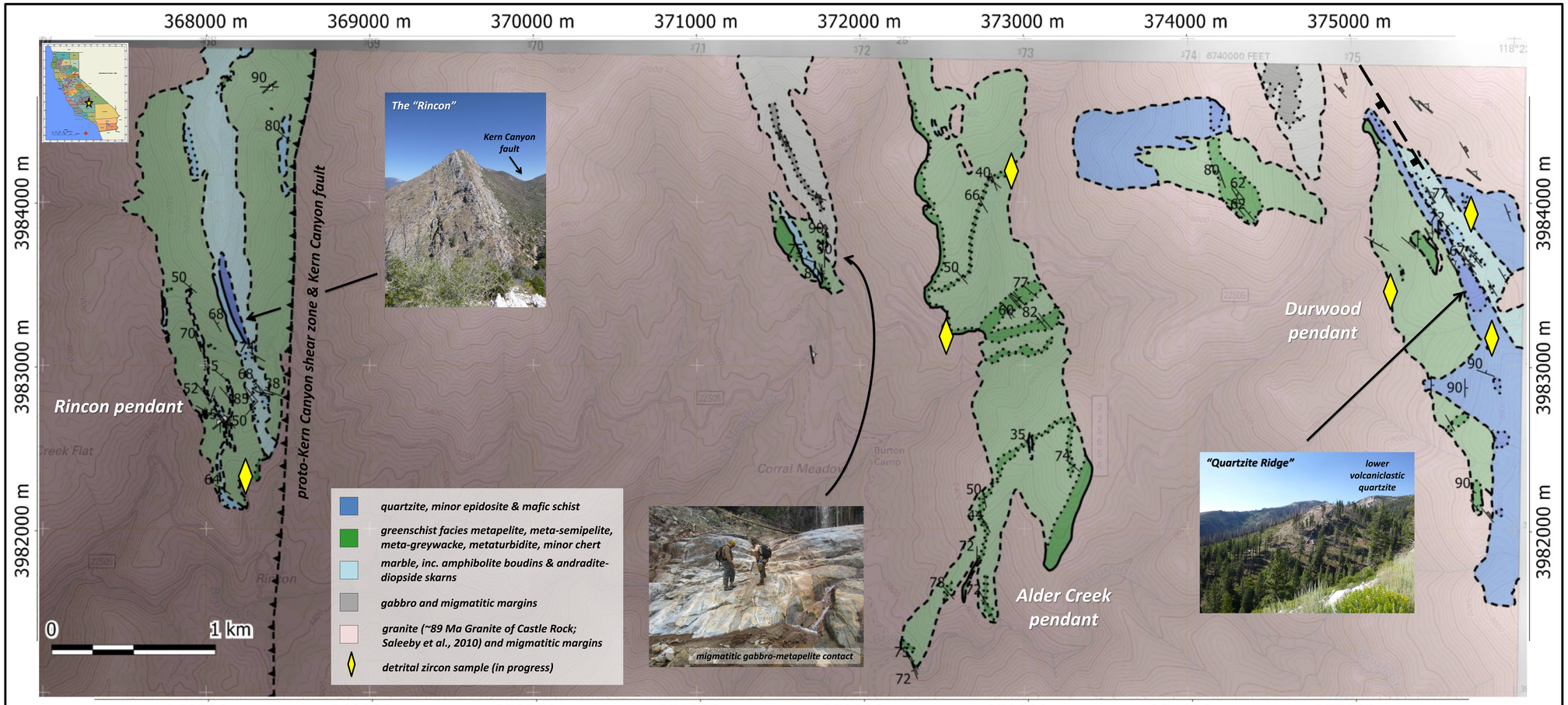
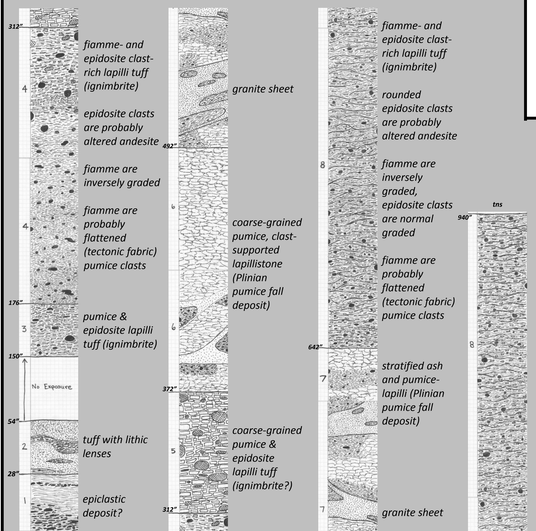
USGS EDMAP-supported geologic mapping of the Fairview 7.5' quadrangle in southern Tulare County, southern Sierra Nevada mountains, southern California, is shedding light on the structure and stratigraphy of several marine metasedimentary and metavolcanic inliers or roof pendants within the batholith. The ***"Durwood"***, ***"Alder Creek"***, and ***"Rincon" inliers*** are mapped in detail for the first time and appear to represent parts of the Paleozoic to Mesozoic supracrustal succession into which the batholith was emplaced.

All three pendants are characterized by very low to low regional metamorphic grade (lower greenschist facies), strong vertical, NW-striking foliation, vertical stretching lineations and localized contact metamorphism (andalusite-porphyritic hornfels) from the engulfing batholith.

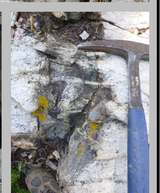


Volcaniclastic Quartzites



Stretched, angular epidosite clast (andesite protolith?) in the upper volcaniclastic quartzite. Veins are calcite-filled.

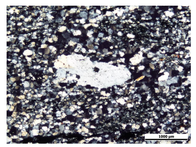
Fiamme- and epidosite-lithic-rich lapilli tuff (ignimbrite); lower volcaniclastic quartzite.



Peperite dike (epidosite after andesite?) cross-cutting sedimentary quartzite; Durwood.

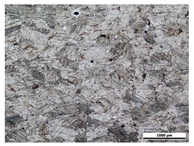
The Durwood pendant is notable for being composed of a near-vertically-dipping, moderately deformed sequence of (from bottom up) meta-semipelite, metavolcanic rocks (quartzite), marble, and quartzite. The metavolcanic sequence is composed of water-reworked felsic tuffs including at least one primary pyroclastic density current deposit (ignimbrite) with andesitic clasts, peperite, and andesitic sheet-like intrusions. **The presence of volcanic lithofacies suggests that the Durwood pendant succession was deposited in the Mesozoic**; possible correlatives exist along strike at the Mineral King caldera (north; Busby-Spera, 1986) and in the Erskine Canyon / Lake Isabella area (south; Saleeby & Busby, 1986; Saleeby et al., 2010).

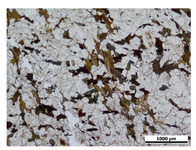
Metased. Petrography



LEFT: dynamically recrystallized quartzite with relic quartz grain.

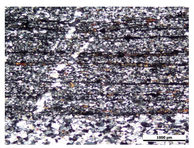
RIGHT: dynamically recrystallized calcite in marble (Durwood shear zone).





LEFT: Quartz-biotite-hornblende hornfels developed in semipelite at the margin of the Alder Creek pendant.

RIGHT: Relic bedding and graded bedding in recrystallized semipelite; Rincon pendant.

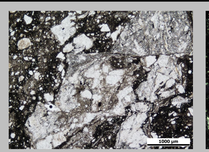


Structure

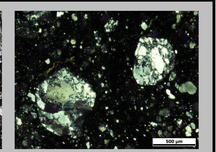
Each inlier is a steeply-dipping homocline with a steep or vertical stretching lineation.

The Rincon pendant, and adjacent Fairview pendant (not shown), appear to be partly structurally controlled by the reverse ***proto-Kern Canyon shear zone*** (Busby-Spera & Saleeby, 1990) because an asymmetric strain gradient increases in intensity towards the fault trace where it abuts batholitic rocks. The ***Kern Canyon fault*** (Moore & Du Bray, 1978; Nadin & Saleeby, 2010) is an dextral-normal fault developed along the older shear zone.

The Durwood pendant hosts a 20 m-wide ductile shear with normal sense-of-shear within the middle marble unit (mylonitized) and may be bounded by a second major shear zone to its immediate east.



Ultracataclasite (float) from the Kern Canyon fault – note at least two generations of catalasite.



Granite porphyroclasts in Kern Canyon fault ultracataclasite. Crossed polars.

Pervasive, parallel and closely spaced vertical fractures in the granite adjacent to the Kern Canyon fault.

Vertically plunging amphibolite boudins in mylonitic marble from the Durwood pendant. Pen for scale.

Summary

These metasedimentary pendants are typical of those mapped elsewhere in the central and southern Sierra Nevada batholith: narrow, steeply dipping sequences of often monotonous semipelitic metaturbidites interbedded with marbles and quartzites. Regional metamorphism is typically lower greenschist facies except where hornfels facies contact metamorphism dominates.

Continuing studies of these inliers and their structural architecture will improve understanding of the assembly of the Sierra Nevada batholith and the role of arc-parallel shear zones in controlling down-warping of supracrustal successions.

USGS EDMAP 2013-14 award G13AC00119 to GA
NSF CREST scholarships to ZM and AK

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