

Detailed Investigations of Rendija Canyon Rhyodacite, a Complicated Volcanic Complex in the Sierra de los Valles, Jemez Mountains, New Mexico

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Pajarito Mtn
3 Myr

Rendija Dome Complex
3.5 - 5.4 Myr



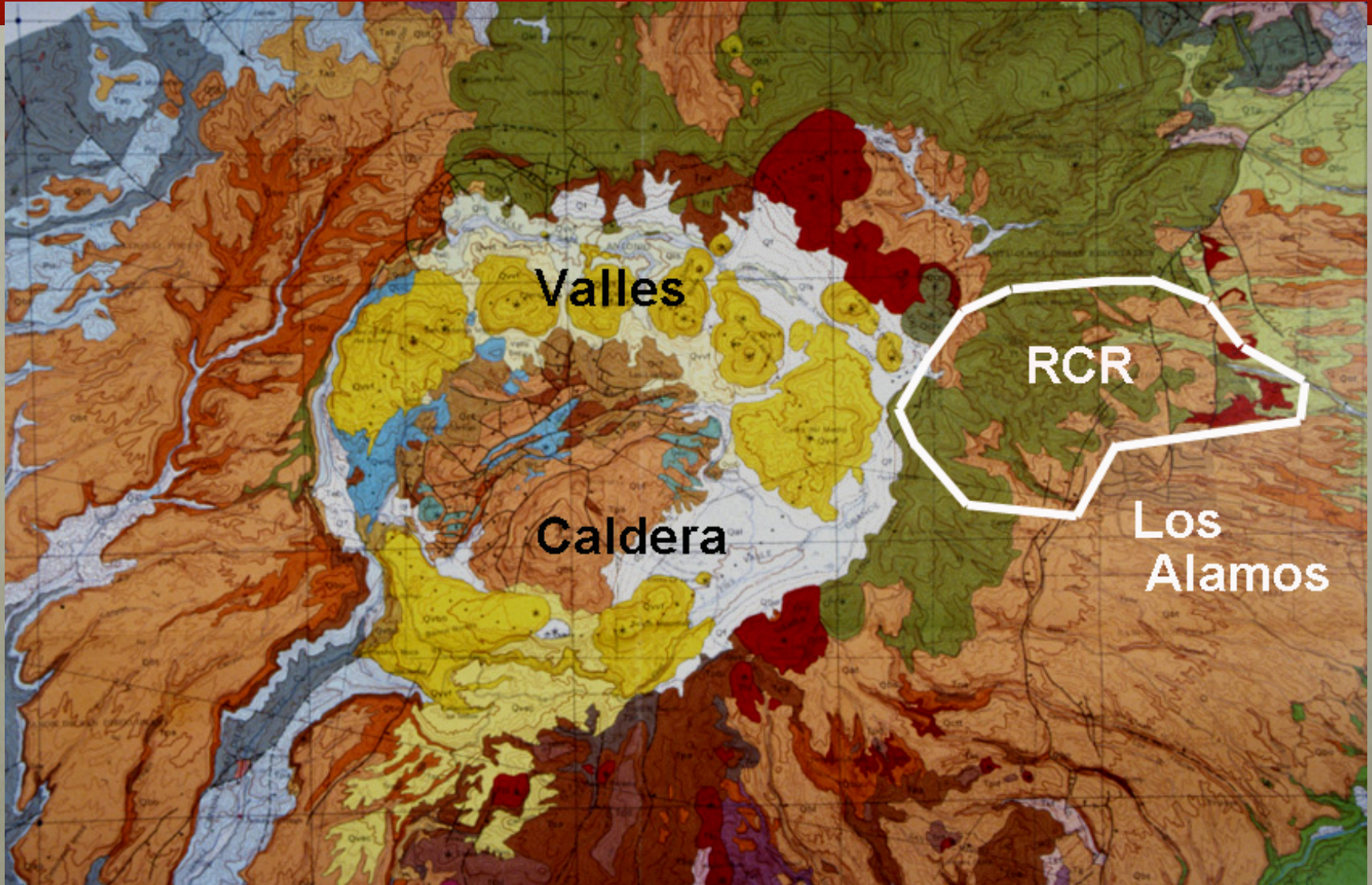
Rendija Canyon Rhyodacite, $\approx 40 \text{ km}^2$

very rugged, burned over twice, poor access

- 1** Lumped unit with few published ages
- 2** In April 2020 we remapped and sampled unit to better characterize timescales of silicic dome complexes and source provenances of detrital sanidines

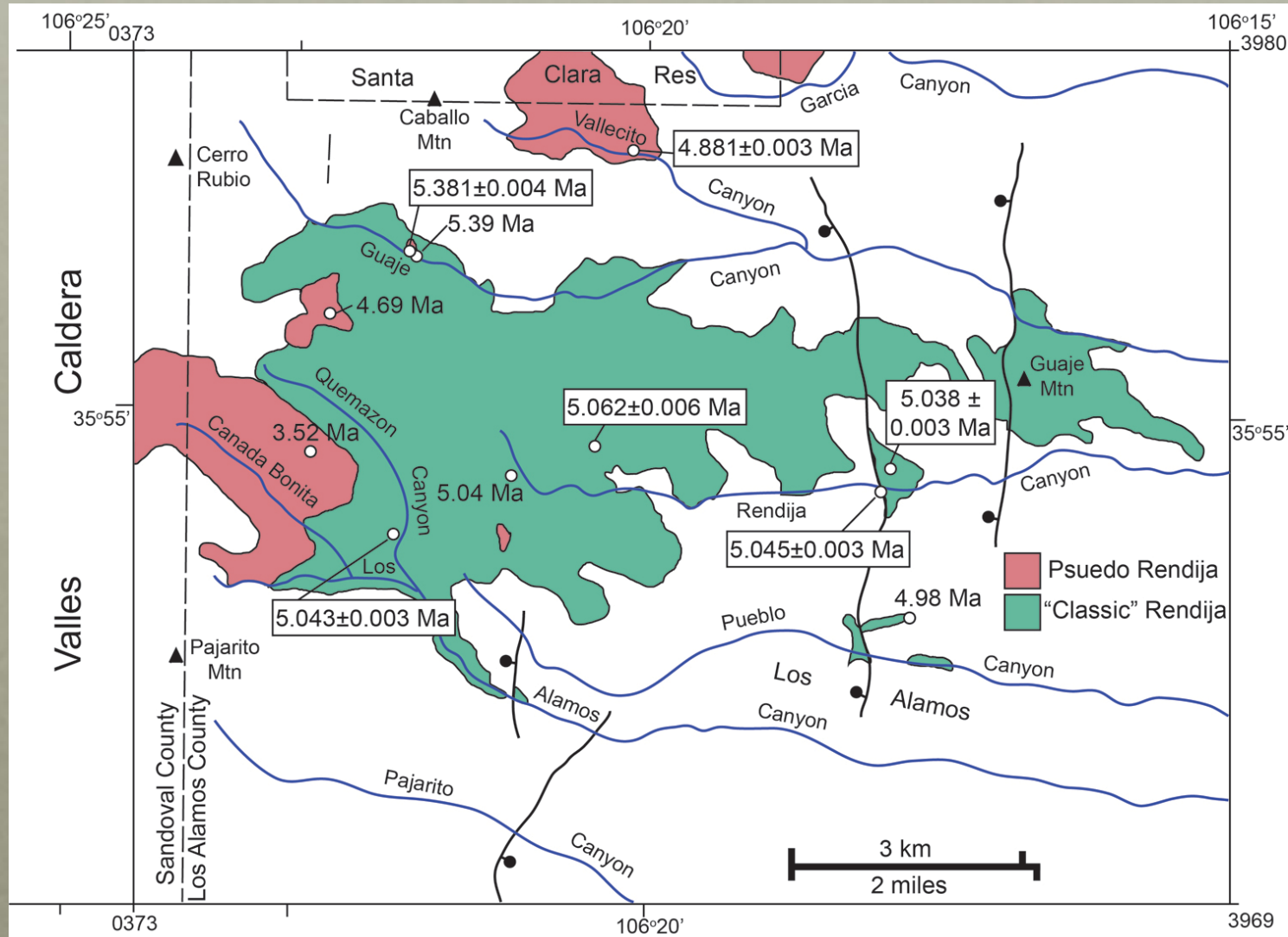
Jemez Mountains Volcanic Field

(Smith et al., 1970)



RCR Map, “Classic” and “Pseudo”

(modified from Kempton et al., 1998 & Goff et al., 2011)



Original RCR is now 7 units (youngest to oldest; dates in Ma)

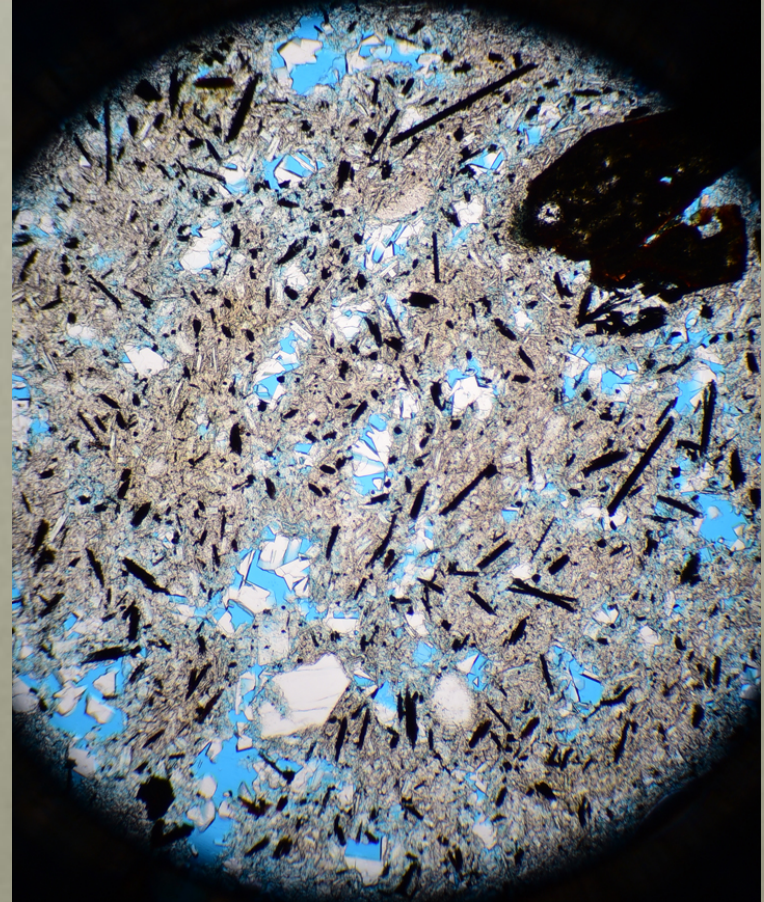
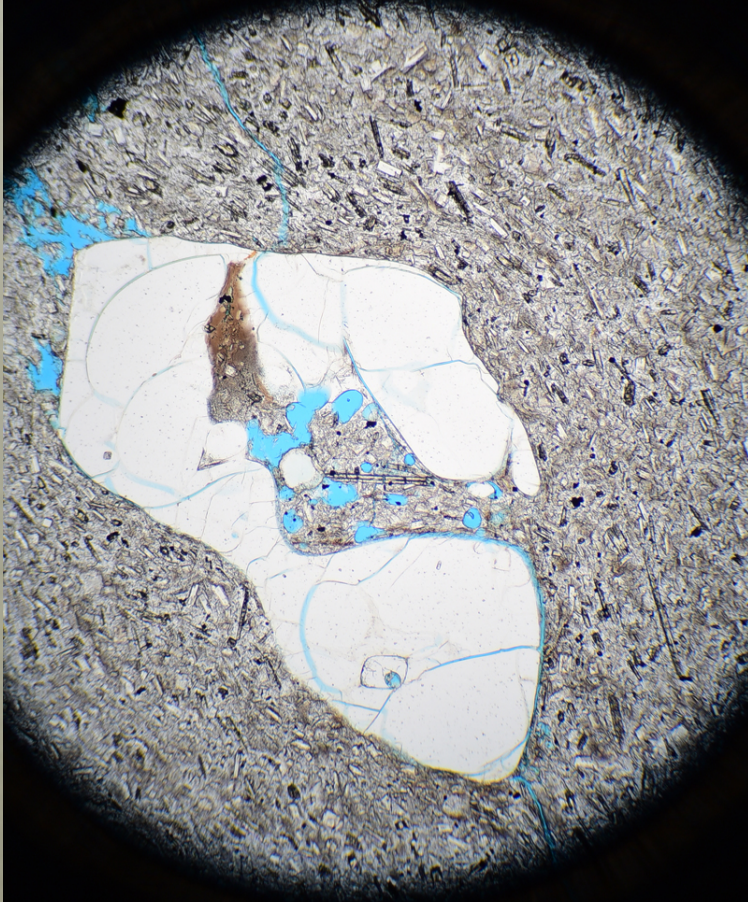
- 1. Cañada Bonita dacite, 3.52 ± 0.23
- 2. Skyline rhyodacite, 4.69 ± 0.17
- 3. Garcia Canyon rhyodacite, undated
- 4. Vallecito Canyon rhyodacite, 4.881 ± 0.003
- 5. Upper Pueblo Canyon rhyolite, undated
- 6. “Classic” RCR, 5.062 ± 0.006 to 5.038 ± 0.003 , $n=4$
- 7. Upper Guaje Canyon rhyodacite, 5.381 ± 0.004

Petrology; all coarse porphyritic with qtz & large feldspars except one unit

Cañada Bonita	Sparse Quartz	Lots of Cpx + Bio + Hbd	Mafic Enclaves
Skyline	Abundant Quartz	Lots of Bio + Hbd + Cpx	Mafic Enclaves
Garcia Canyon	Abundant Quartz	Bio + Cpx, sparse Hbd	Mafic Enclaves – Some Syenitic
Vallecito Canyon	Abundant Quartz	Bio + Cpx, sparse Hbd	Mafic Enclaves
Up Pajarito Can	Fine-grained – Tiny Quartz	Tiny San + Plag + Cpx	No Enclaves
“Classic” RCR	Abundant Quartz	Lots of Cpx + Bio + minor Hbd	No Enclaves
Upper Guaje Can	Quartz	Lots of Cpx + Bio + Hbd	No Enclaves?

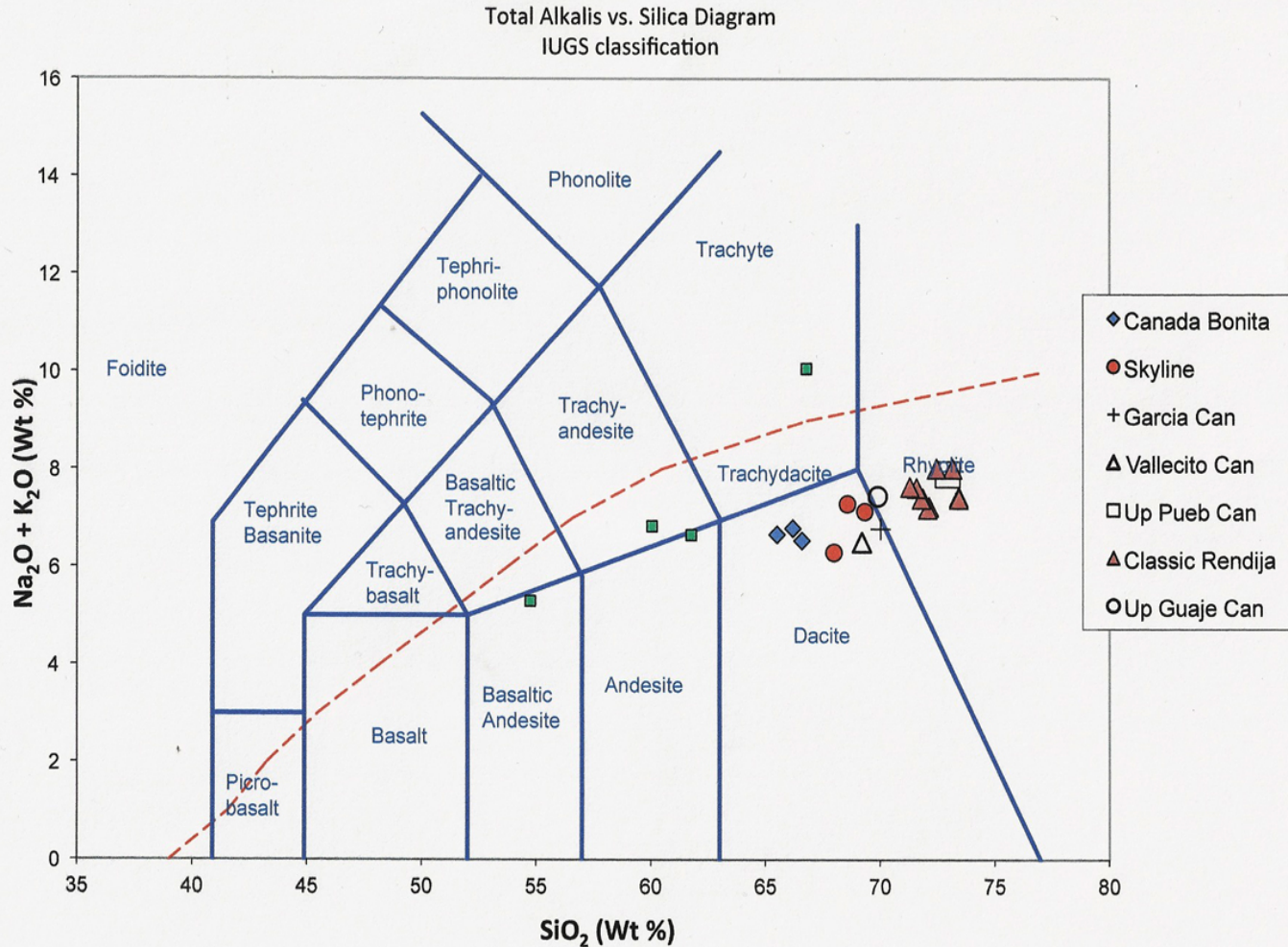
Photomicrographs, RCR

Qtz (left) vs. Vesicle-rich top (FOV = 5 mm)



Total Alkalis vs. Silica

(La Bas et al., 1986)



“Classic” RCR, $\geq 90\%$ of total area massive to sheeted, hackly, coarse porphyritic

Guaje Mtn, undated



Upper Rendija Canyon
 5.062 ± 0.006 Ma



Upper Pajarito Canyon Rhyolite Intrudes “Classic” RCR; very fine-grained



Enclaves & Enclaves

Cañada Bonita dacite
 3.52 ± 0.23 Ma

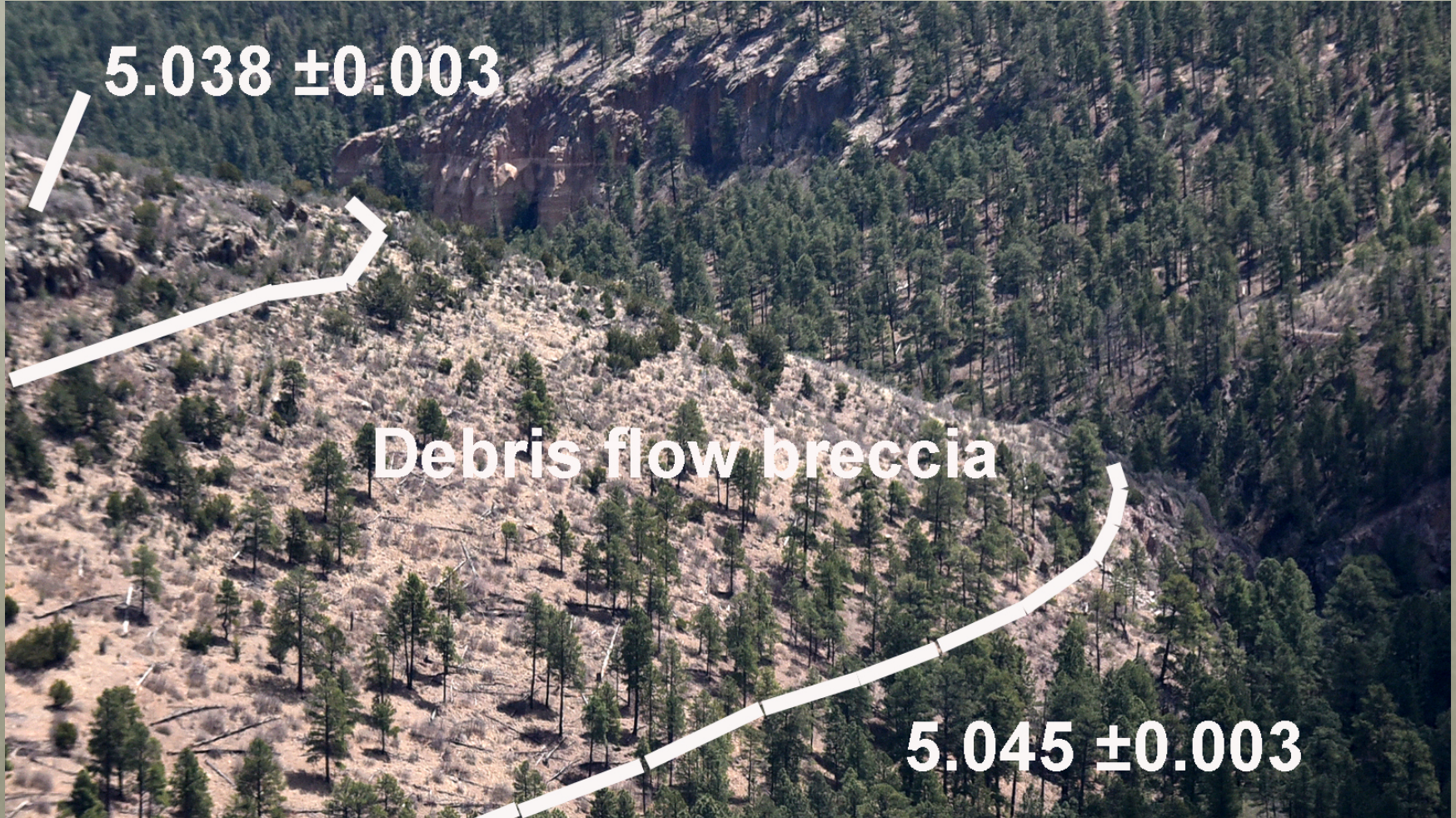


Vallecito Canyon rhyodacite
 4.881 ± 0.003 Ma



Rendija Box; Key Location

(7 ±4 ka difference in age of flows)



Debris Flow Breccia, Rendija Box



Conclusions

- Original RCR now 7 distinct units, 3.52 to 5.39 Ma
- Each unit has unique age, petrography and chemistry
- **“Classic” RCR, 5.062 ± 0.006 to 5.038 ± 0.003 , $n=4$**
- **“Classic” RCR erupted in 24 ± 7 ka, 3+ eruptions**
- Ongoing project, more dates and chemistry coming