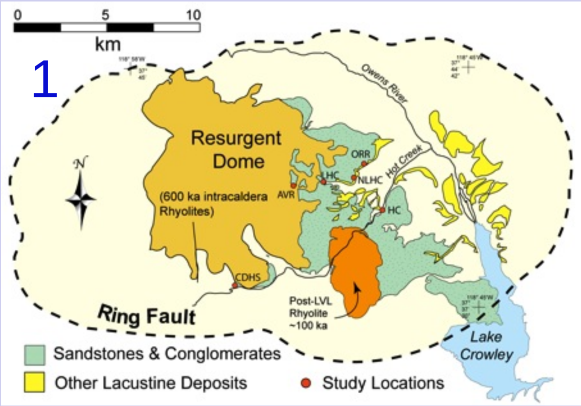
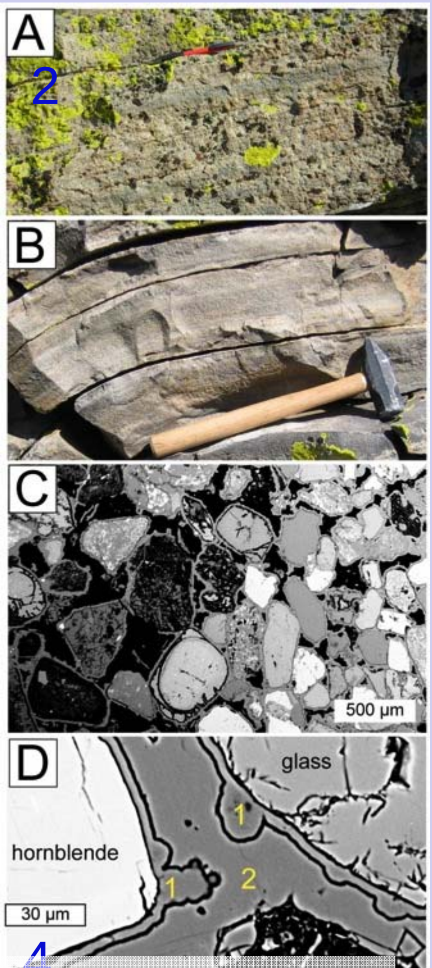
# Sandstone Silicification in a Caldera Lake: Implications for Cementation at High Geothermal Gradients








1 & 2 are cement bands

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***Long Valley Lake:*** The supervolcanic eruption of the Bishop Tuff 760,000 years ago created the Long Valley (LV) caldera in east-central CA (1). A Pleistocene lake filled the caldera (2), and Sandstones deposited in the lake were cemented by siliceous geothermal fluids (3A,B).

***Objective & Significance:*** In this study at LV, we seek to better understand the rates and modes of sediment cementation in an ancient geothermal system. Fortuitous exposure of the LV sandstones creates an ideal natural laboratory to study cementation (2).

***Outcomes:*** LV sandstones have high $\delta^{18}O$ cements (19-35‰; 3 & 4) Oxygen isotopes indicate that cements were deposed at relatively low temperature from waters that were a blend of geothermal and lake sources. Multiple generations of cements indicate gradual cooling of the system with time (Fig. 4).