Supplementary Materials for

**Basal nucleation and the prevalence of ascending swarms in Long Valley caldera**

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The PDF file includes:

Figs. S1 to S6

Other Supplementary Material for this manuscript includes the following:

Data files S1 and S2
Figure S1: a) Frequency-magnitude distribution of earthquake magnitudes for the entire catalogue, within the Caldera, and in the Sierra Nevada Block (SNB). b) Cumulative histogram of epicentral and depth distances between earthquake events common to our enhanced catalogue and the regional NCEDC catalogue.

Figure S2: Comparison of duration magnitudes calculated by the Northern California Earthquake Data Centre (NCEDC) and corresponding calibrated local magnitude calculated in the present catalogue. Only events with $M_L < 2$ are assigned a magnitude in the catalogue, in order to avoid issues due to waveform clipping.
Figure S3: Magnitude of completeness over time calculated over a 2000 event rolling window using the maximum curvature method.
Figure S4: Gaussian mixture model fit of $\eta$ for a) entire catalogue, b) Caldera, c) Sierra Nevada Block (SNB), where vertical lines shows best fit values for children, parents and $\eta_c$. 
Figure S5: Locations of (a, b, c) ascending swarms, (d, e, f) descending swarms, and (g, h, i) vertically stationary swarms.
Fig. S6: Histograms of $\Delta Z$ for clusters in the Caldera (n=171) and the Sierra Nevada Block (n=82).