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Supplementary Materials for

Deep fluid pathways beneath Mammoth Mountain, California, illuminated by migrating earthquake swarms

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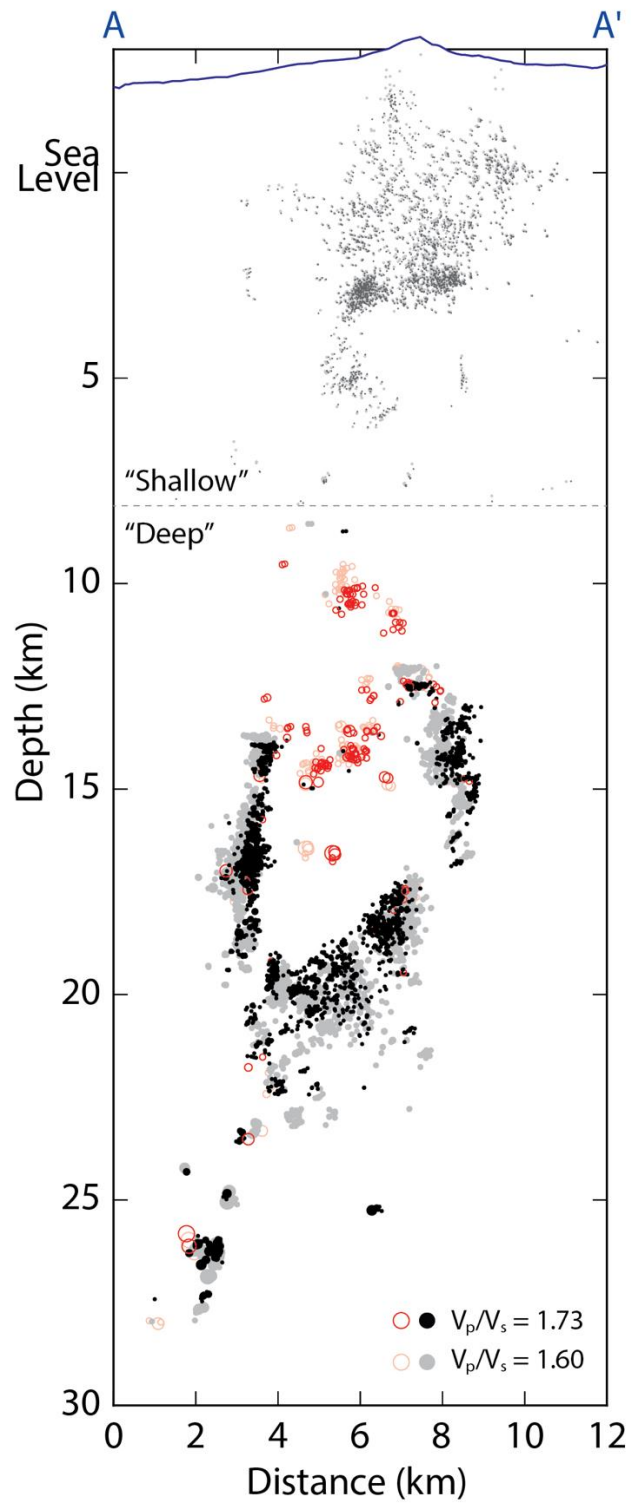
The PDF file includes:

Fig. S1. Difference in relocations using different V_p/V_s ratios.
Legends for movies S1 and S2
Table S1. Velocity model used for relocation.
Table S2. Occurrence of combinations of first-motion picks.

Other Supplementary Material for this manuscript includes the following:

(available at advances.sciencemag.org/cgi/content/full/4/8/eaat5258/DC1)

Movie S1 (.mov format). Three-dimensional rotation of cataloged and relocated hypocenters.
Movie S2 (.mov format). Migration of hypocenters in 30-min windows across A-A′.

A

A'

Sea
Level

5

"Shallow"

"Deep"

10

Depth (km)

15

20

25

30

○ ● $V_p/V_s = 1.73$
○ ● $V_p/V_s = 1.60$

0   2   4   6   8   10   12
Distance (km)

Fig. S1. Difference in relocations using different V_p/V_s ratios. View along A-A' from fig. 1, with locations presented in light colors. Plotted on top at full opacity are relocations where a higher V_p/V_s ratio was used to illustrate the small difference in interpretable structures when using a different velocity model.

Movie S1. Three-dimensional rotation of cataloged and relocated hypocenters. The cross-section rotates around the point (0,0) in fig. 1 in map view. As the view rotates, earthquake locations closest to the foreground are darkest, and fade to lighter gray/pink toward the background. The same symbology as fig. 1 is used to differentiate event types (i.e., filled black for brittle-failure type, open red circles for LP, with symbol size that scales with event magnitude). At left are the original catalog locations, at right are our relocations.

Movie S2. Migration of hypocenters in 30-min windows across A-A′. Earthquakes appear as yellow if they occurred within the window, and fade through red to black as time progresses. If no new events occurred within the next 30 minutes, the frame is skipped. Long period earthquakes are displayed as open circles with no differentiation in color.

Table S1. Velocity model used for relocation.

Top of layer (km b.s.l)	V_p (km/s)
-3.0	0.03 (air)
-2.5	5.5
2	6.0
25	6.1
30	6.2

Table S2. Occurrence of combinations of first-motion picks.

MRD	MDC	MCV	Number of earthquakes
Up	Up	Up	16
Up	Up	Down	17
Up	Down	Up	88
Up	Down	Down	3
Down	Up	Up	1
Down	Up	Down	74
Down	Down	Up	8
Down	Down	Down	6