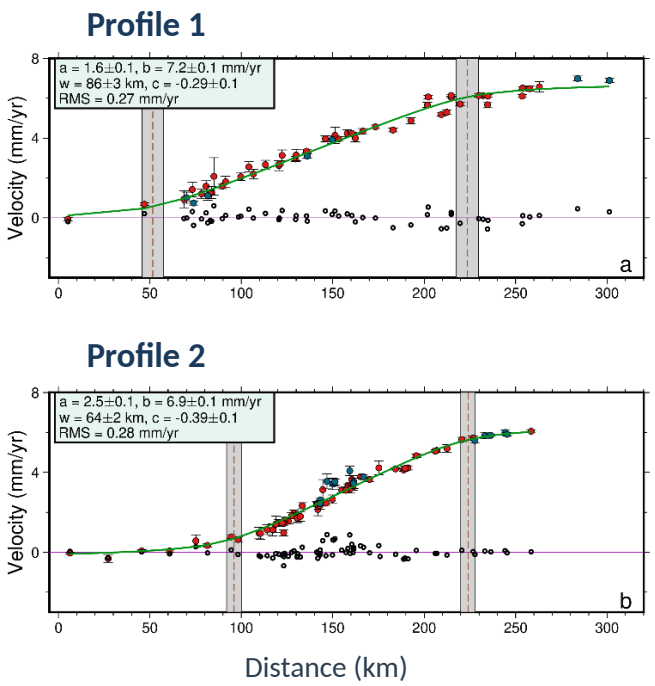
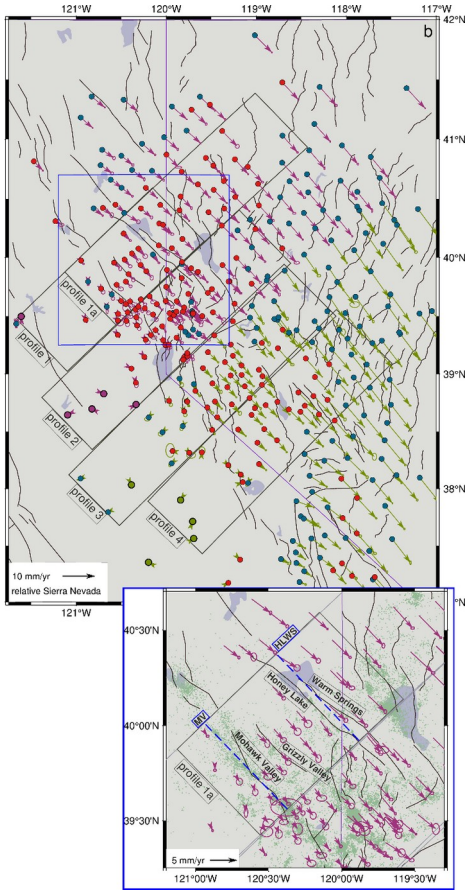
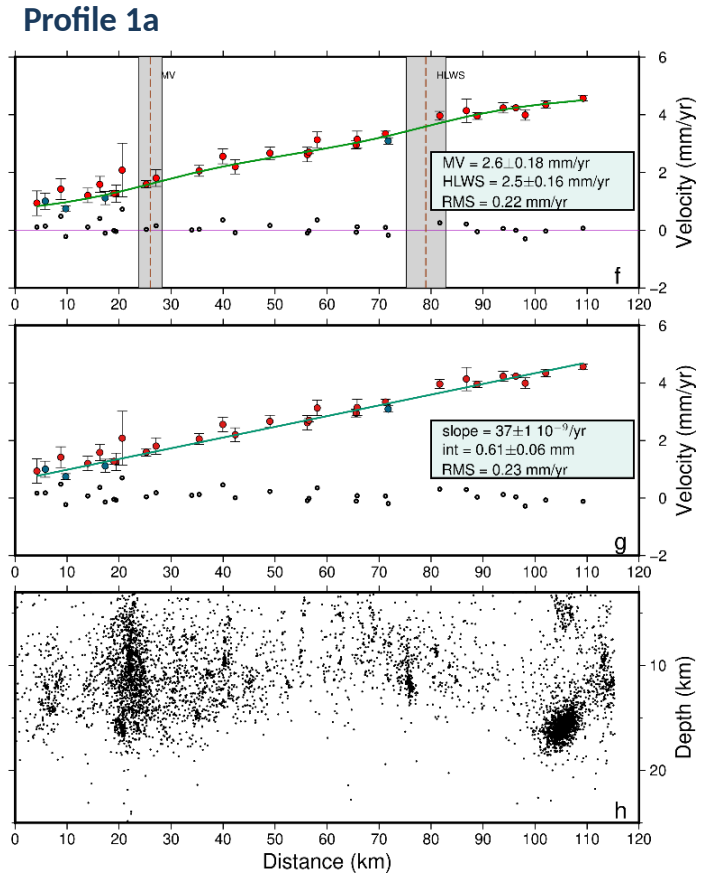
GNSS velocity profiles across the northern Walker Lane

Miller et al. (2024)







What the profiles show

1 No strain localization at the faults

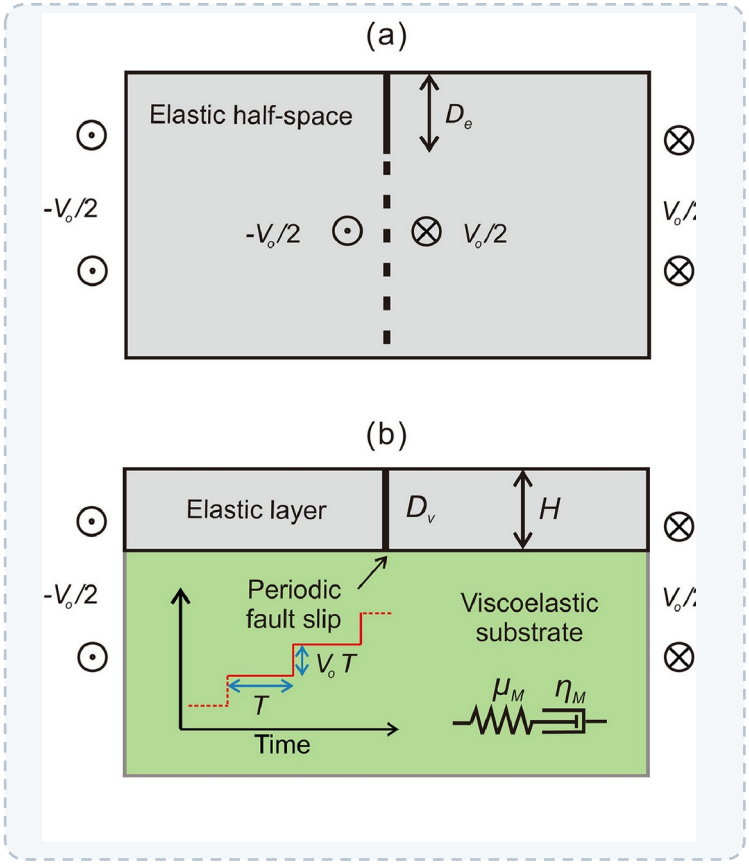
Velocities rise steadily across mapped faults, with no fault-centered gradient. On profile 1a, one uniform strain rate (corresponding to 4.1 mm/yr) fits as well as two locked faults (RMS 0.23 vs 0.22 mm/yr).

2 The shear-zone model fits the data

All four profiles, each with different “geology”, are fit by distributed shear: zones 116–172 km wide carrying 6.9–10.1 mm/yr, RMS 0.27–0.48 mm/yr.

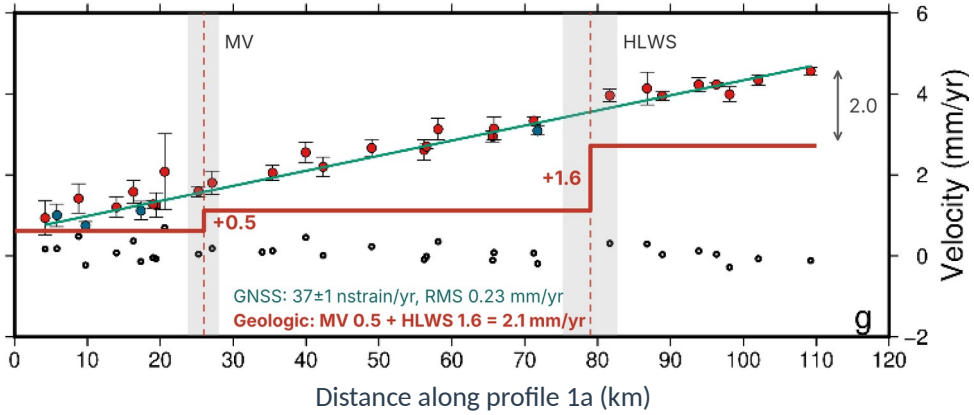
3 No dislocations below the seismogenic crust

Instead, faults are zones of weakness that are stressed across a broad area. The total budget is what matters. The premise of block models need to re-considered.

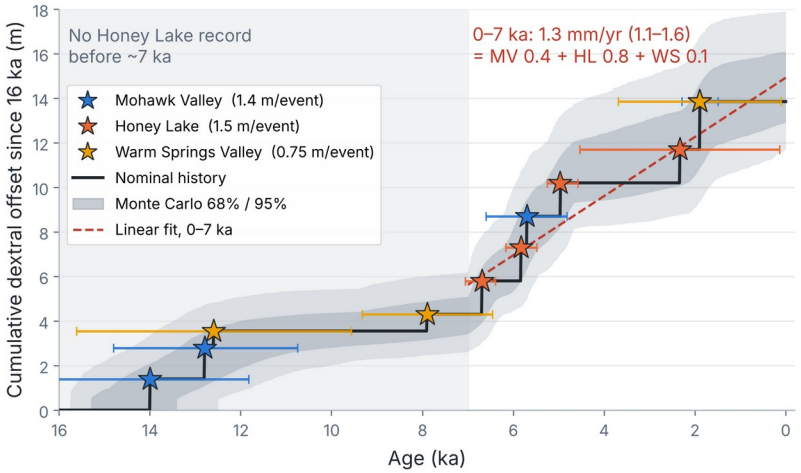


Implications: slip rates and long-term evolution

Profile 1a: GNSS vs geologic slip rates



Mohawk Valley + Honey Lake/Warm Springs



Geology carries about half

Across profile 1a GNSS gives ~4.1 mm/yr; geologic rates on MV + HLWS sum to ~2.1. The earthquake history gives ~1.3 mm/yr for 0–7 ka.

Activity moves around

Warm Springs active ~21–12 ka then quiet; Honey Lake clustered mid-Holocene.Should be considered as one system

Missing Slip

The ~2 mm/yr remainder sits
a) on other faults,
b) occurs “off-fault”, or
c) we are missing offset on known faults