

**Supporting Information for
“Full-waveform joint inversion of ambient noise data and teleseismic P waves:
method and applications to Central California”**

**Kai Wang^{1,2}, Yingjie Yang¹, Chengxin Jiang³, Yi Wang⁴, Ping Tong^{5,6}, Tianshi Liu⁷, Qinya
Liu^{2,7}**

¹Department of Earth and Environmental Sciences, Macquarie University, Sydney, Australia

²Department of Physics, University of Toronto, Toronto, Canada

³Research School of Earth Science, The Australian National University, Canberra, Australia

⁴School of Earth Sciences and Engineering, Sun Yat-sen University, Guangdong, China

⁵Division of Mathematical Sciences, School of Physical and Mathematical Sciences, Nanyang Technological University,
Singapore

⁶Asian School of the Environment, Nanyang Technological University, Singapore

⁷Department of Earth Science, University of Toronto, Toronto, Canada

Contents

1. Figures S1 to S6

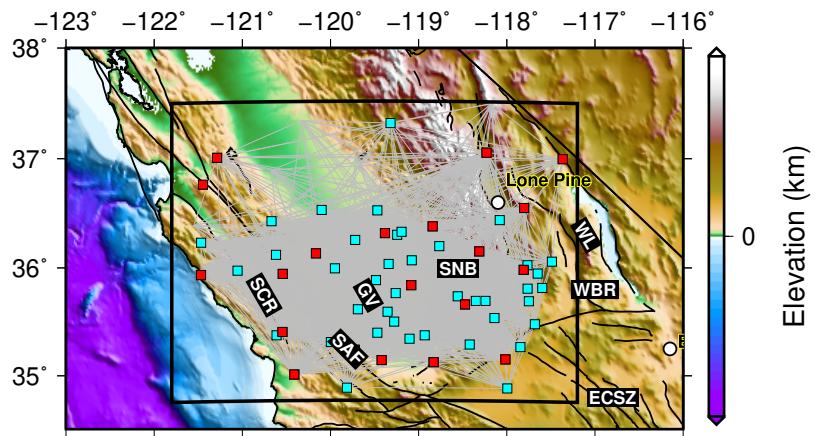


Figure S1. The 60 virtual sources (colored rectangles) used in ambient noise adjoint tomography, out of which 19 (red color) are selected for line searches.

References

- Kennett, B. L., Engdahl, E., & Buland, R. (1995). Constraints on seismic velocities in the Earth from traveltimes. *Geophysical Journal International*, 122(1), 108–124.

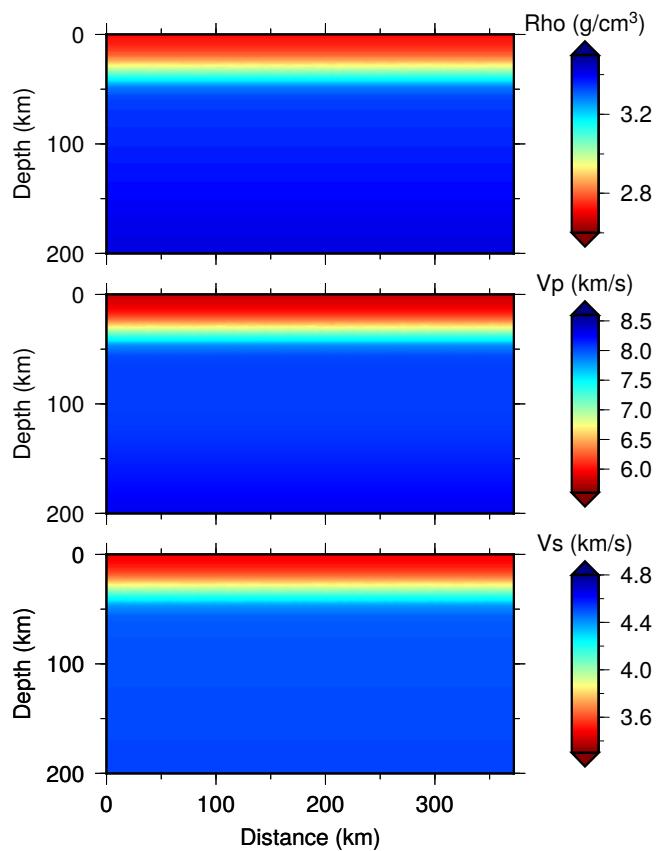


Figure S2. The density, V_p and V_s of the initial model extracted from the AK135 model (Kennett et al., 1995) smoothed by a 3D Gaussian function with horizontal and vertical radii of 5 km and 10 km.

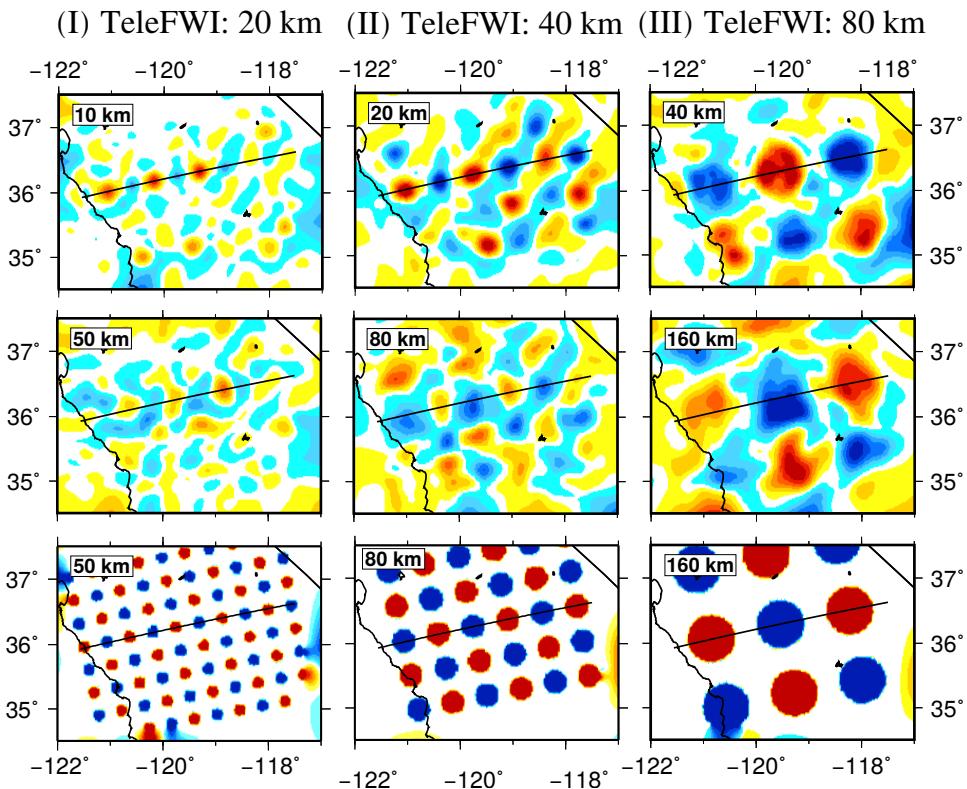


Figure S3. Horizontal cross-sections of inverted and input checkerboard models of Vs (along profile A-A') with anomaly size of 20 km (left columns), 40 km (middle columns) and 80 km (right columns). The text boxes show the depths for extracting the velocity perturbations.

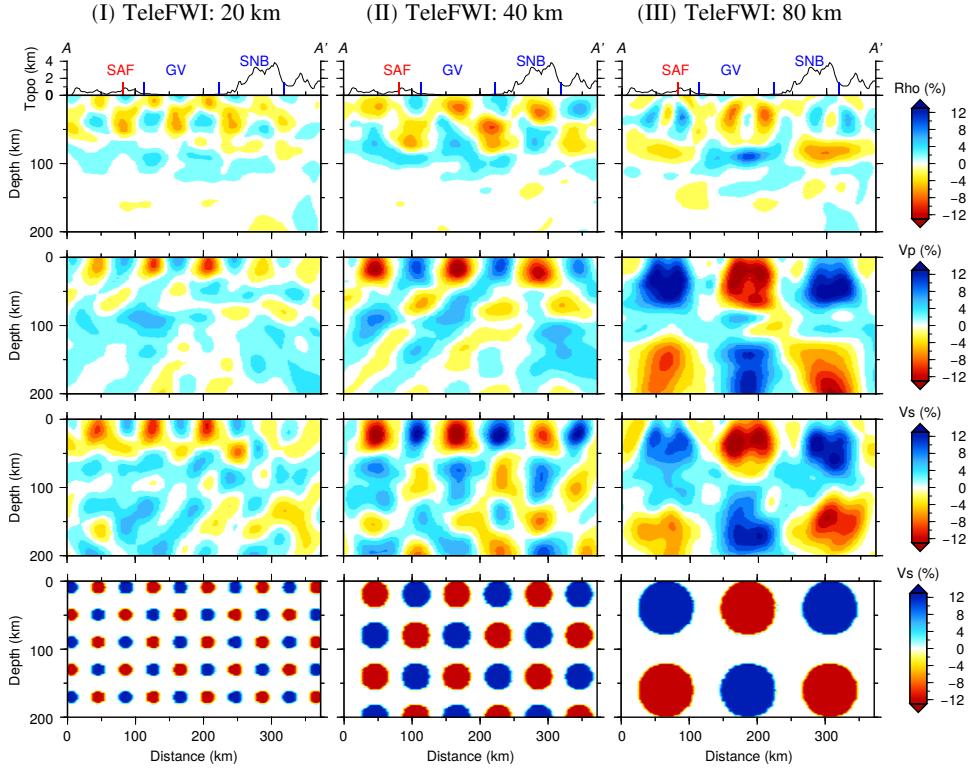


Figure S4. Vertical cross-section (A-A') of recovered density, V_p and V_s models for the three checkerboard tests in Figure S3.

(I) TeleFWI: 20 km (II) TeleFWI: 40 km (III) TeleFWI: 80 km

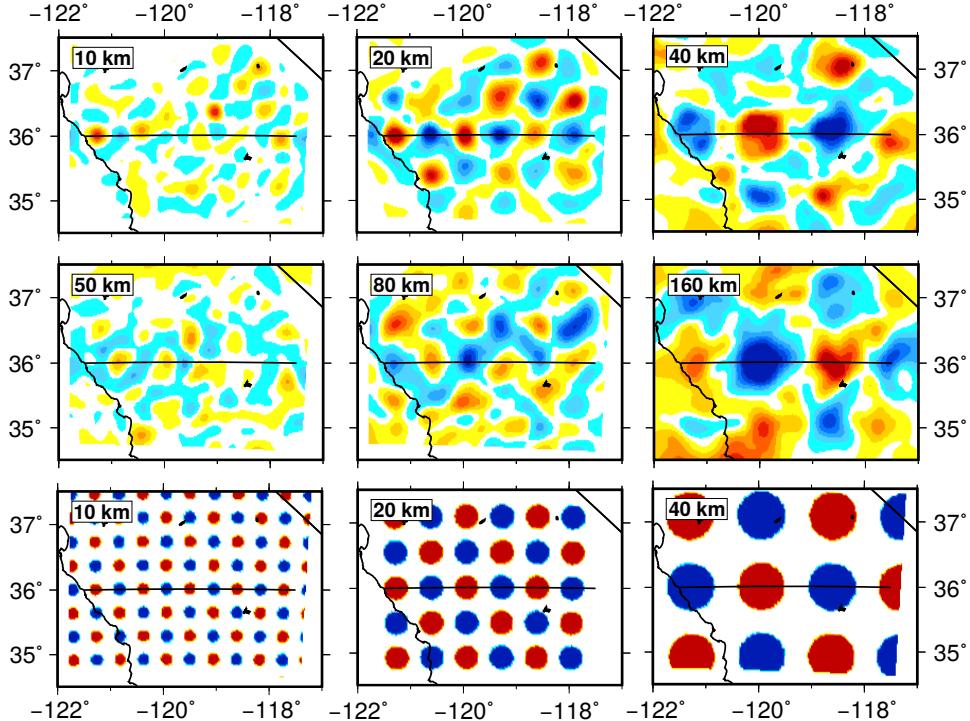


Figure S5. Horizontal cross-sections of inverted and input checkerboard models of V_s (along profile B-B') with anomaly size of 20 km (left columns), 40 km (middle columns) and 80 km (right columns).

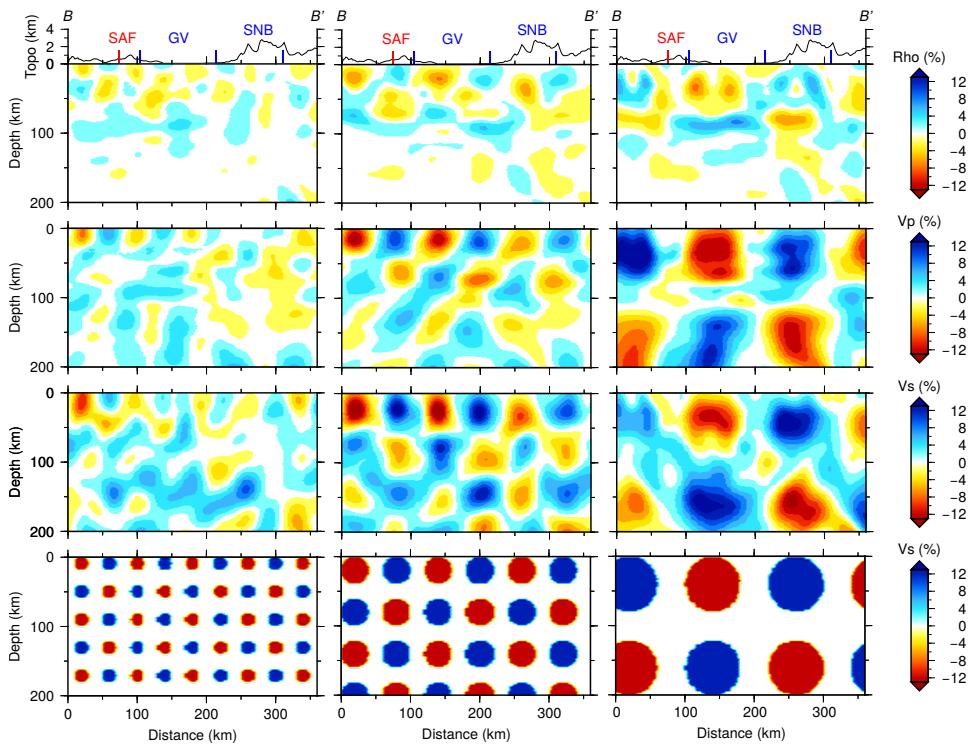


Figure S6. Vertical cross-section (B-B') of recovered density, Vp and Vs models for the three checkerboard tests in Figure S5.