

Supplemental Material for **Probable surface ruptures along the San Juan fault in the recently-deglaciated northern Cascadia forearc**

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Description of supplemental material

The supplemental material is comprised of 19 figures (Figures S1–S19), and 9 Data files. The figures show cross sections from the vertical separation measurements, hillshaded plots of the drone lidar collections, photographs from the schmidt hammer data collection, and photos from the ERT profile set-up. The data files include; a shapefile of the mapped lineaments, digital terrain models (DTMs) for the drone lidar sites, ERT measurement files, and terrain files (for the ERT profiles). They are available in the Zenodo repository <https://doi.org/10.5281/zenodo.15103481>.

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List of Data Files

1. Shape file for San Juan Fault (SanJuanFaultTrace.shp)
2. DTM for UPSCARP drone lidar (UPSCARP_dtm_drone.tif)
3. DTM for SLIDE drone lidar (SLIDE_dtm_drone.tif)
4. DTM for GSS drone lidar (GSS_dtm_drone.tif)
5. DTM for EAST drone lidar (EAST_dtm_drone.tif)
6. Data File S1: Resistivity measurements for 3 m spaced line (3m_SJF_merged_2024.stg)
7. Data File S2: Terrain file for 3 m spaced line (Terrain_3m_SJF_merged_2024.trn)
8. Data File S3: Resistivity measurements for 1.5 m spaced line (1.5m_SJF_July22_2024.stg)
9. Data File S4: Terrain file for 1.5 m spaced line (Terrain_1.5m_SJF_July22_2024.trn)
10. Data File S5: Hillshade for tile 92B on the LidarBC portal (92B_Hillshade.tif)
11. Data File S6: Hillshade for eastern portion of tile 92C on the LidarBC portal (92C_E_Hillshade.tif)
12. Data File S7: Hillshade for western portion of tile 92C on the LidarBC portal (92B_W_Hillshade.tif)

Figures

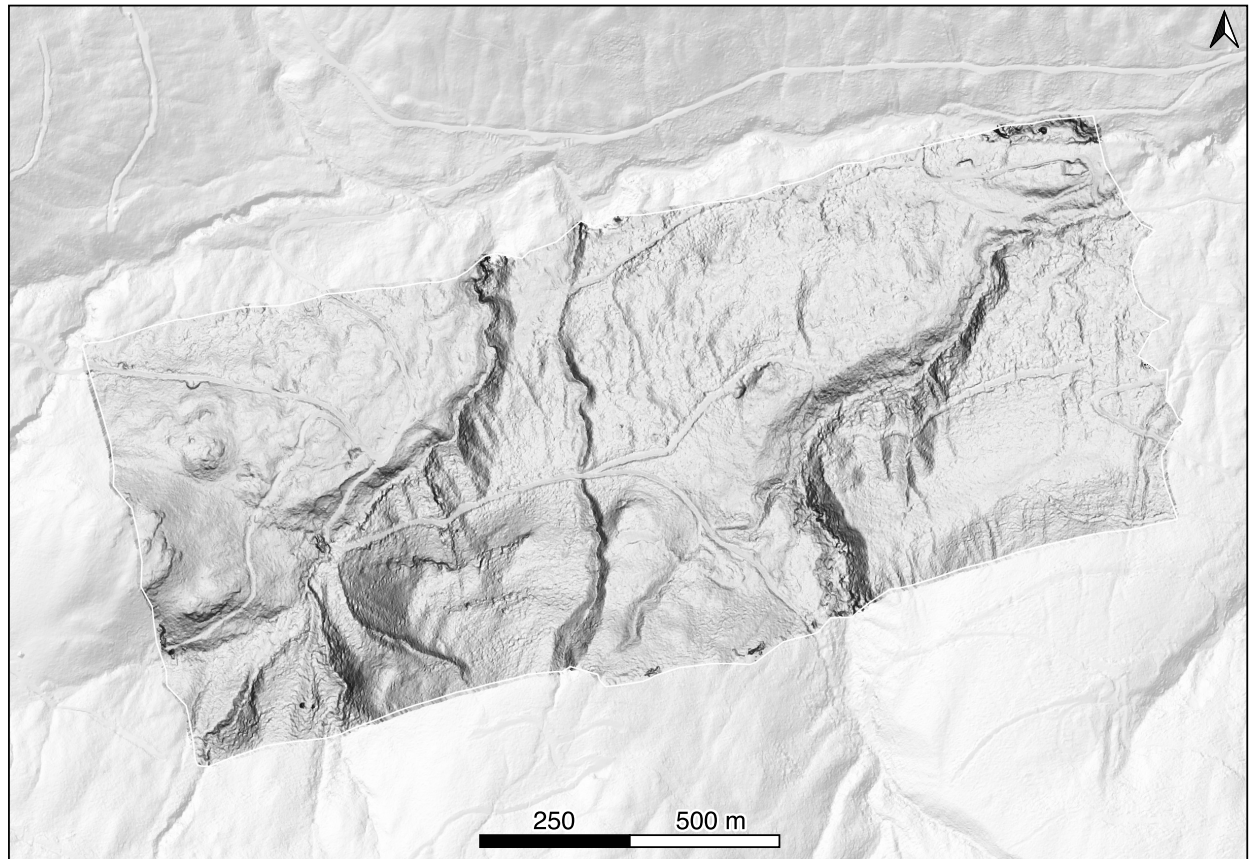


Figure S1: Drone lidar hillshade for the EAST site

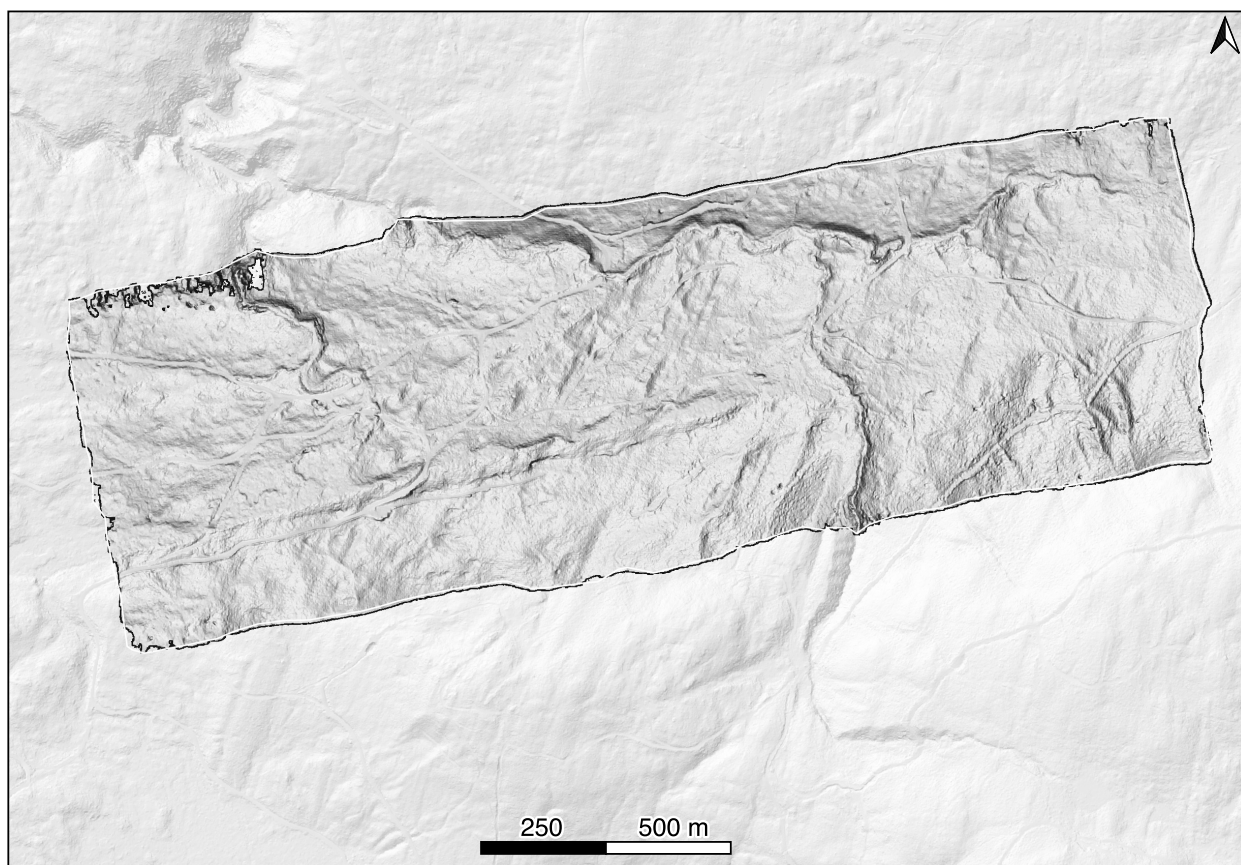


Figure S2: Drone lidar hillshade for the GSS site

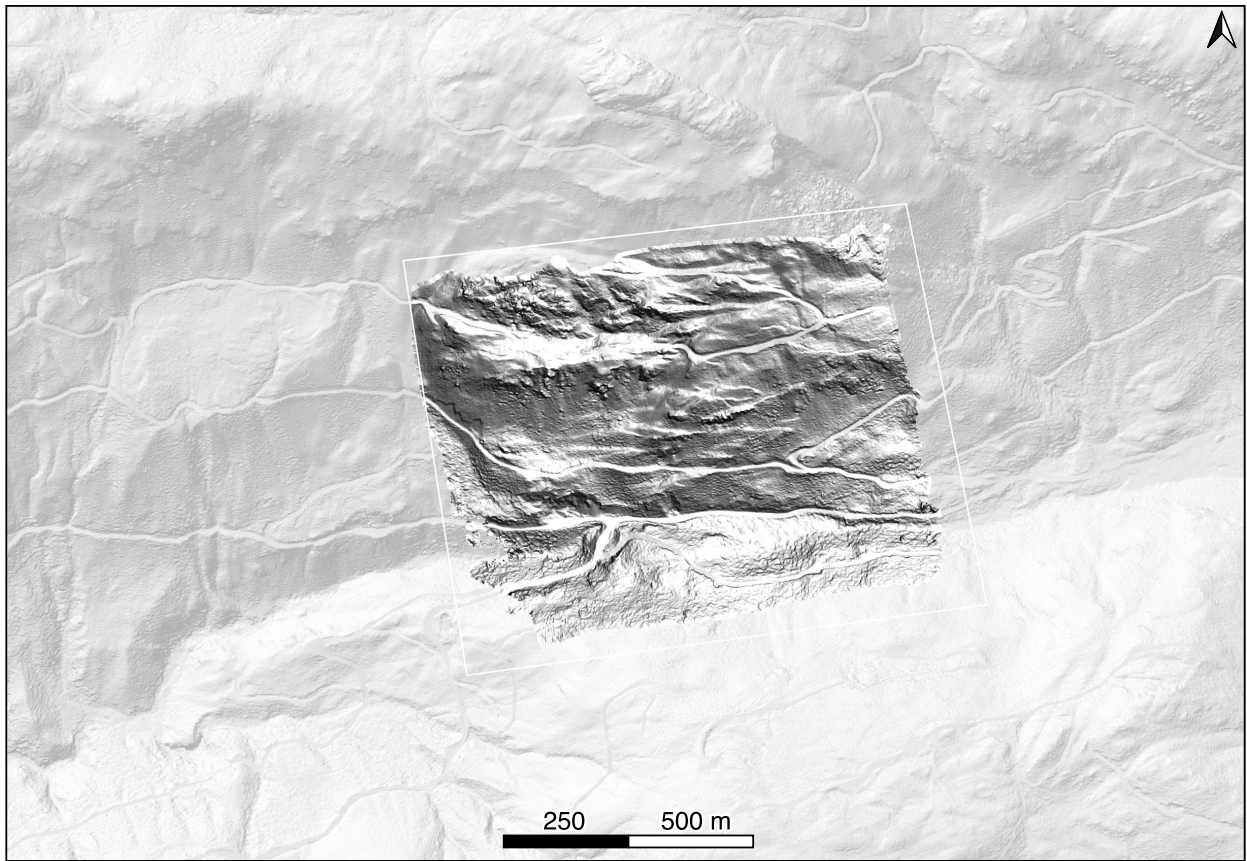


Figure S3: Drone lidar hillshade for the SLIDE site

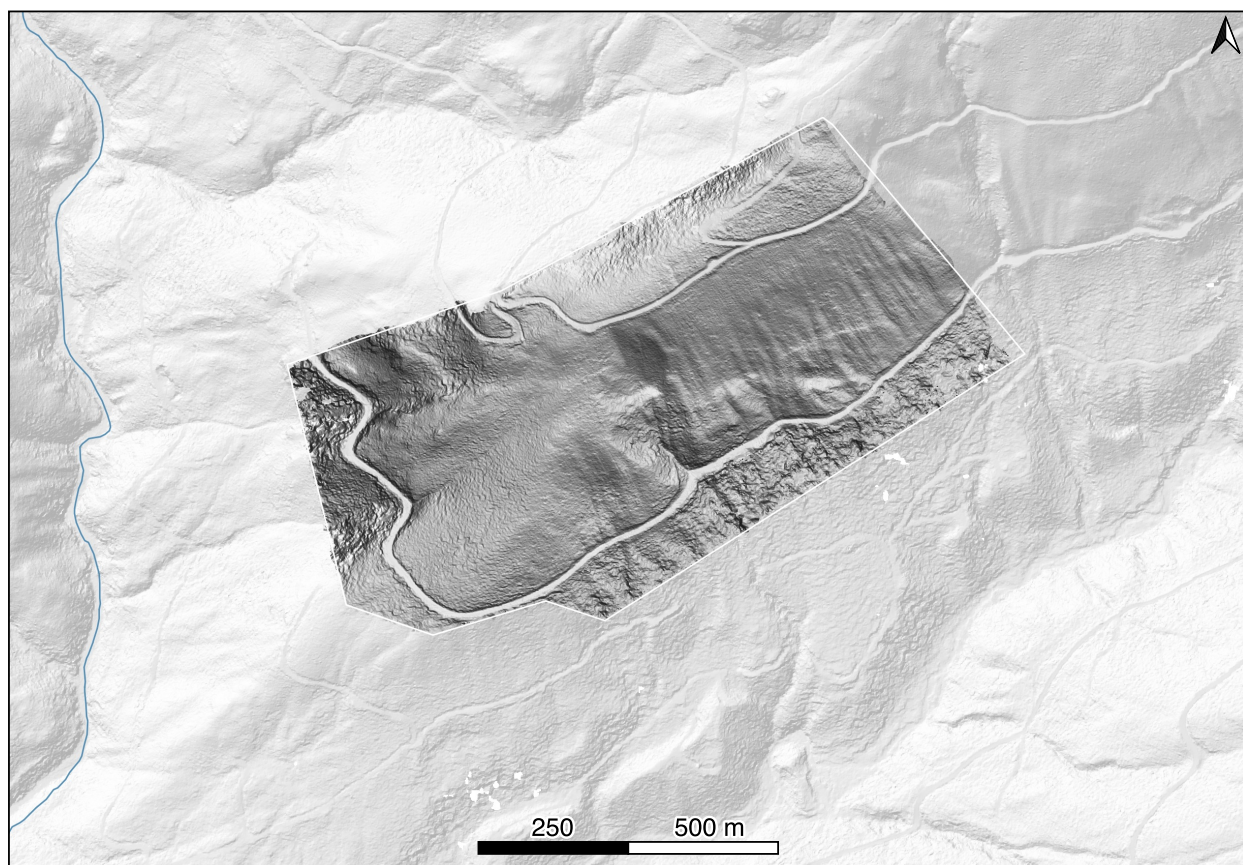


Figure S4: Drone lidar hillshade for the UPSCARP site

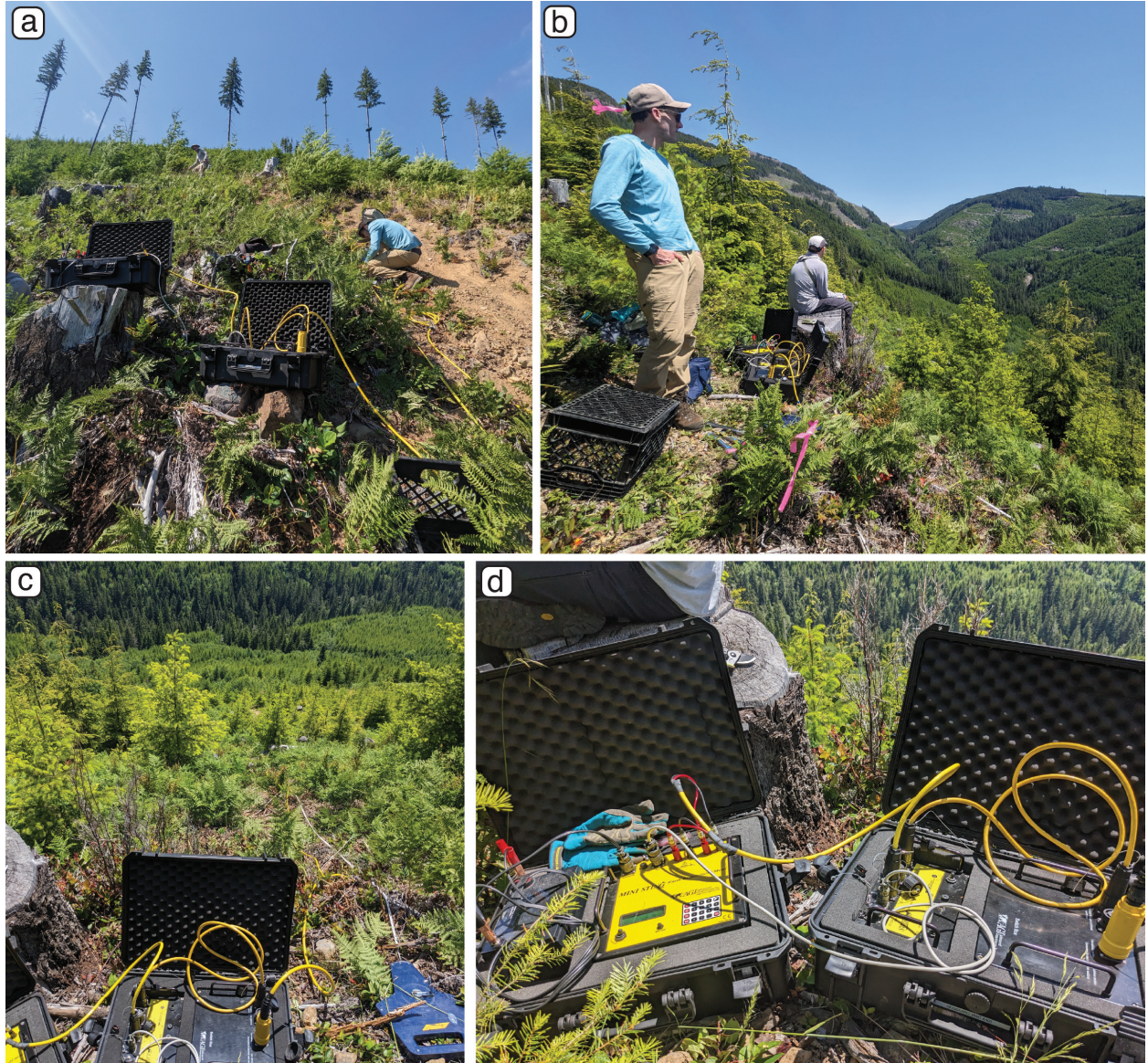


Figure S5: Photographs from the ERT data collection. a) View up the steep slope, top two figures are on the uphill facing scarp. Note that conditions were dry and dusty. b) View to the East, the fault should run through the valley in the distance. c) Luckily the slope was not densely vegetated — the area was clear cut in the last 5–6 years. d) AGI MiniSting R1 resistivity meter.

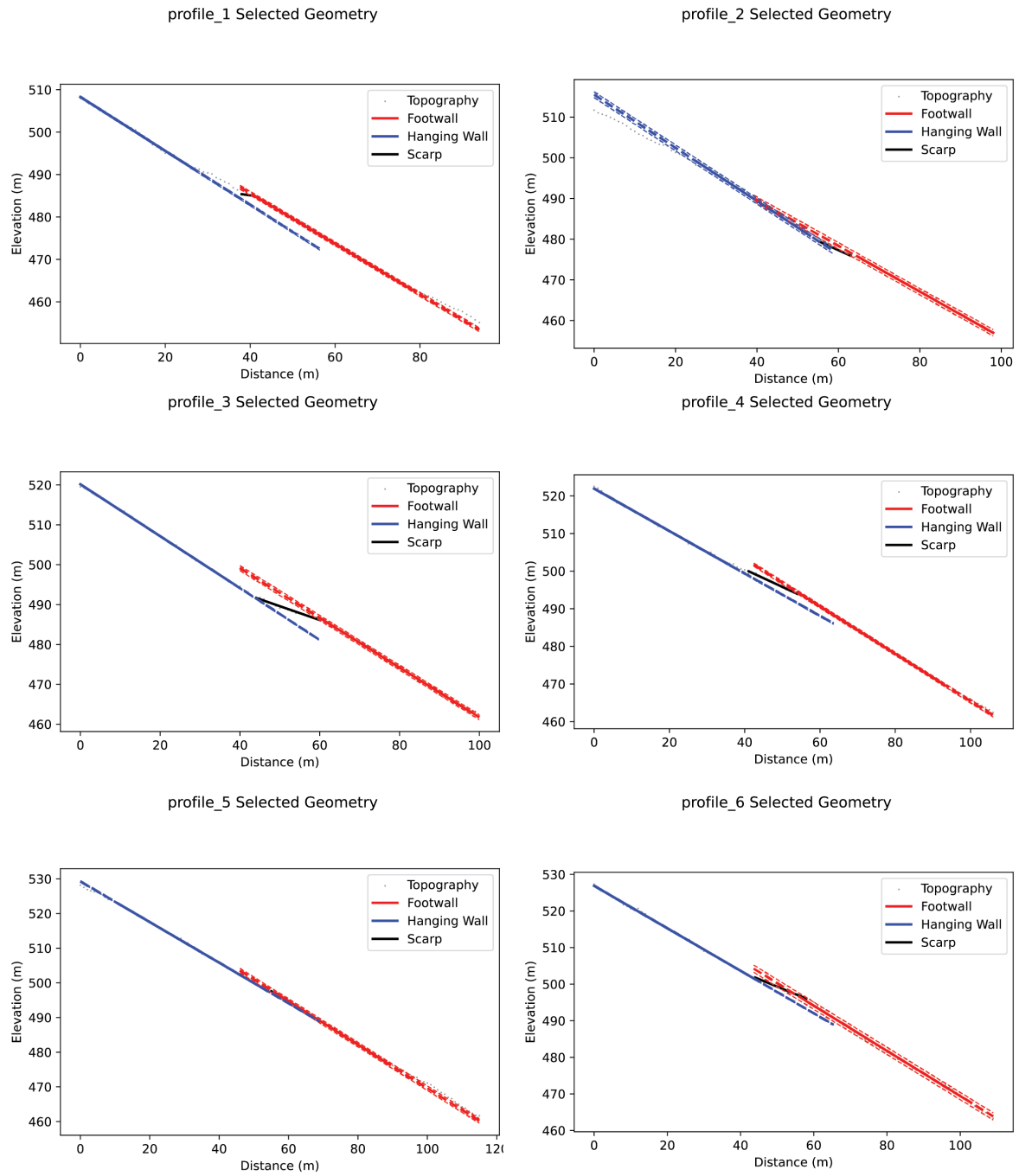


Figure S6: Cross sections for profiles 1–6 from the uphill facing scarp (UPSCARP). Short dashed lines show 95% error in linear regression fit.

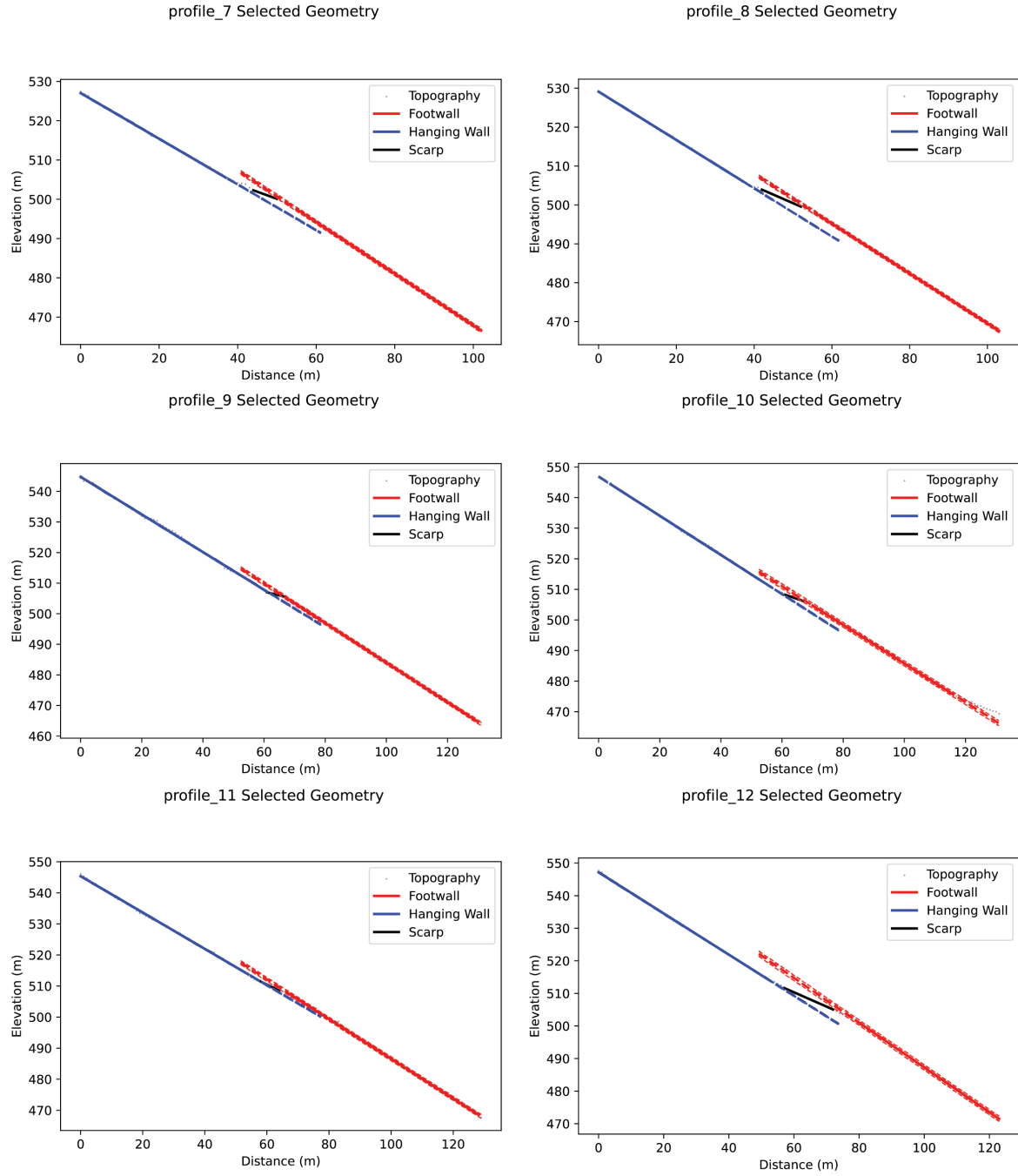


Figure S7: Cross sections for profiles 7–12 from the uphill facing scarp (UPSCARP). Short dashed lines show 95% error in linear regression fit.

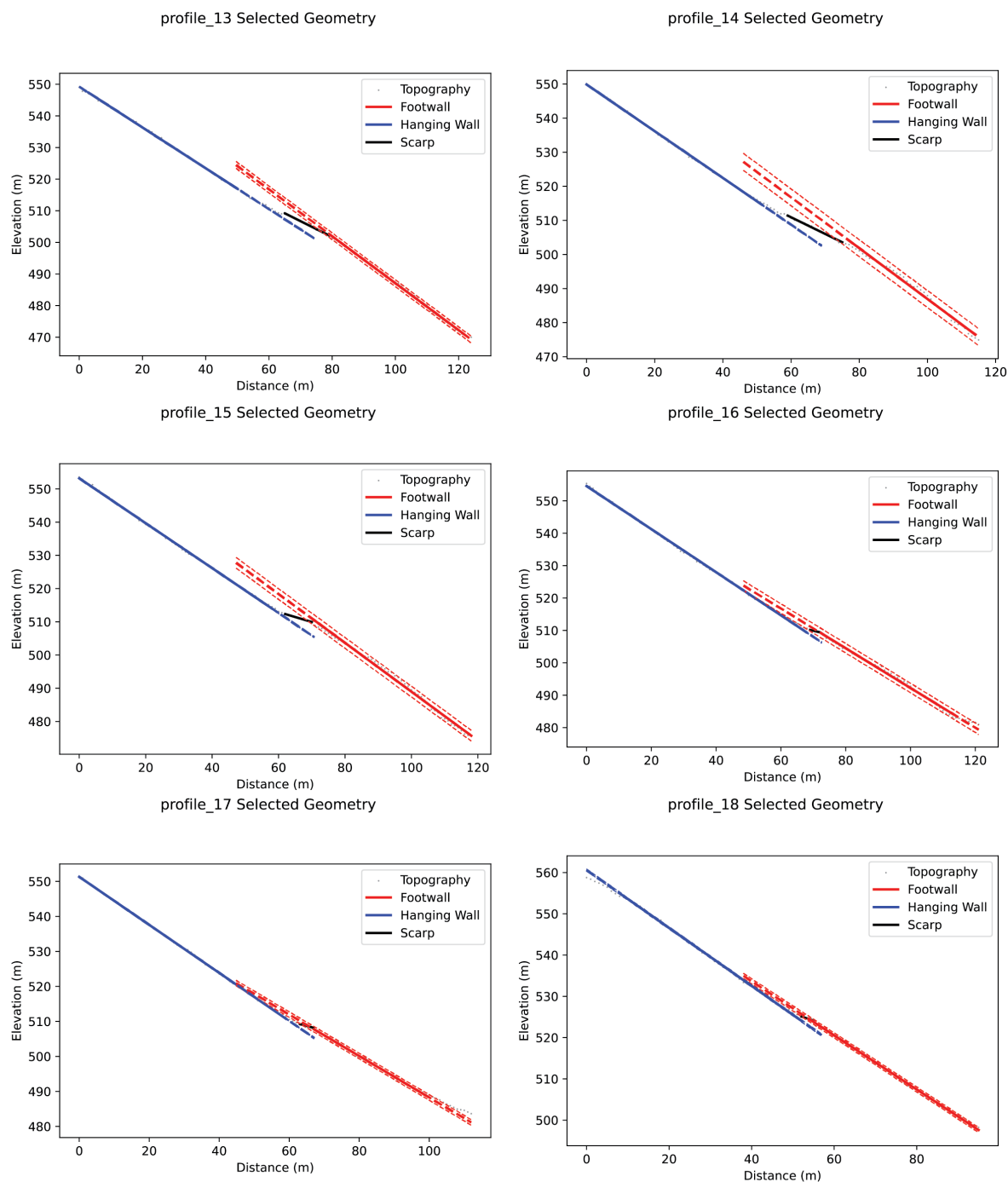


Figure S8: Cross sections for profiles 13–18 from the uphill facing scarp (UPSCARP). Short dashed lines show 95% error in linear regression fit.

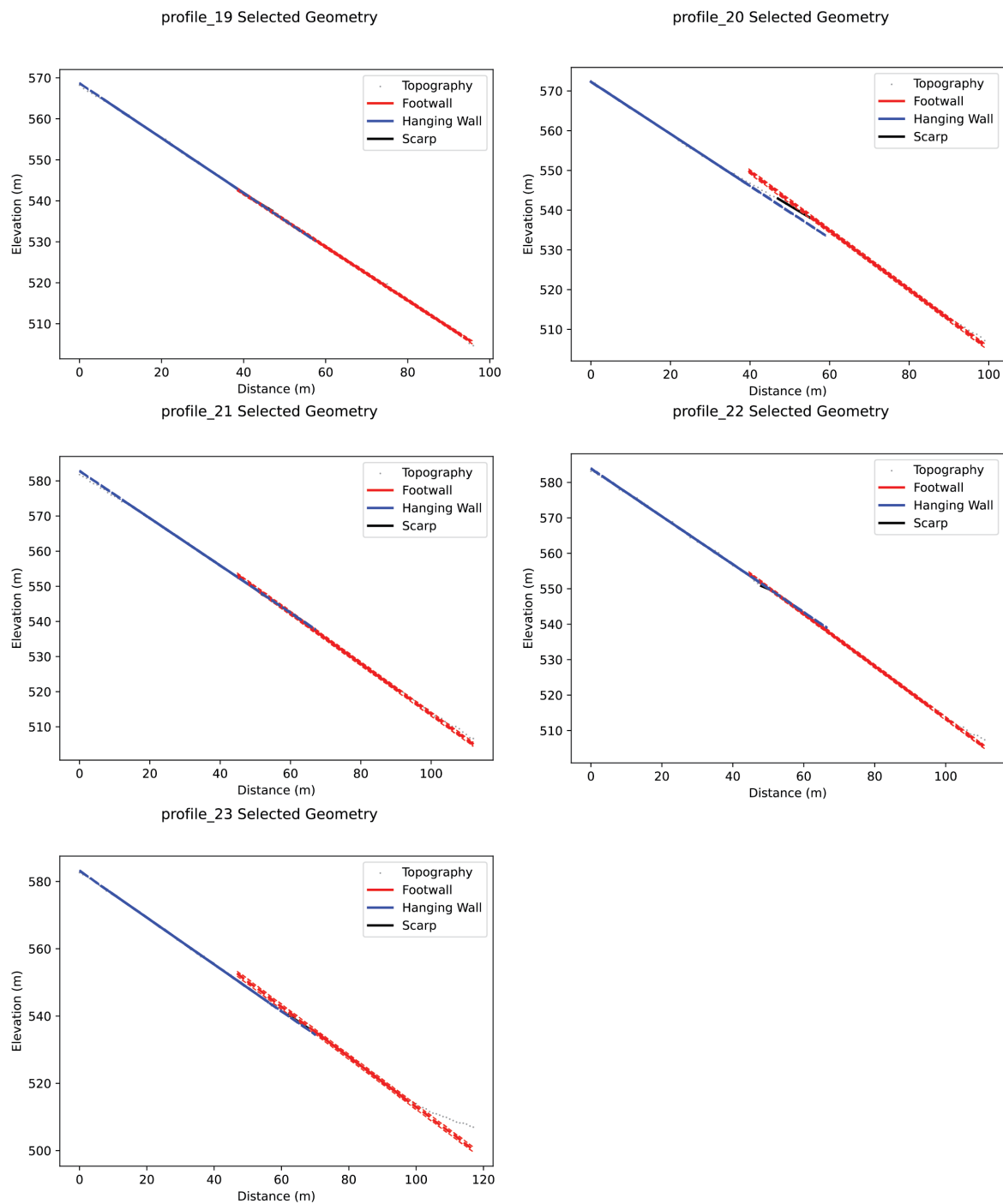


Figure S9: Cross sections for profiles 19–23 from the the uphill facing scarp (UPSCARP). Short dashed lines show 95% error in linear regression fit.

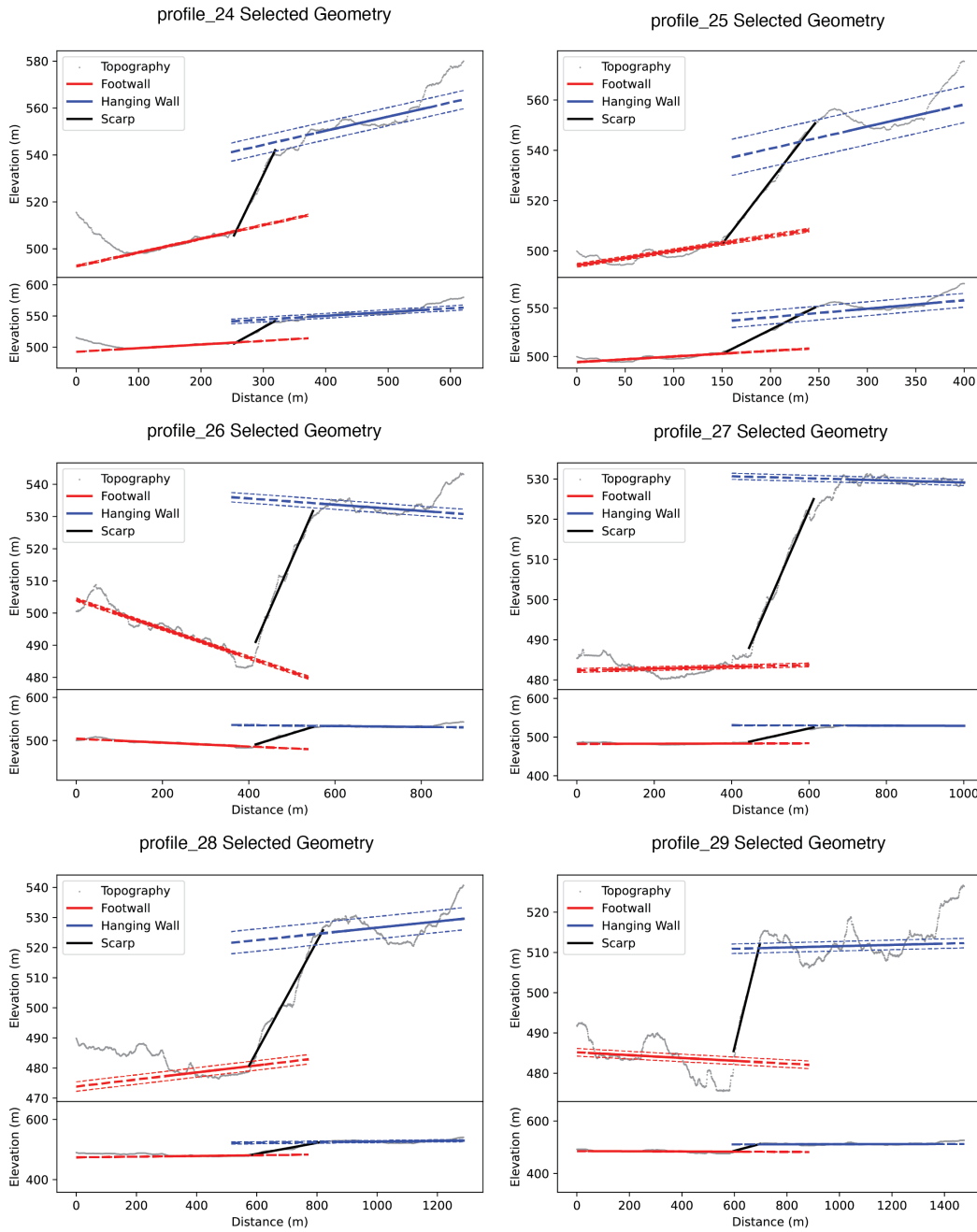


Figure S10: Cross sections for profiles 24–29 from the glacially scoured surface (GSS). Top panel is vertically exaggerated, panel below has no exaggeration. Short dashed lines show 95% error in linear regression fit.

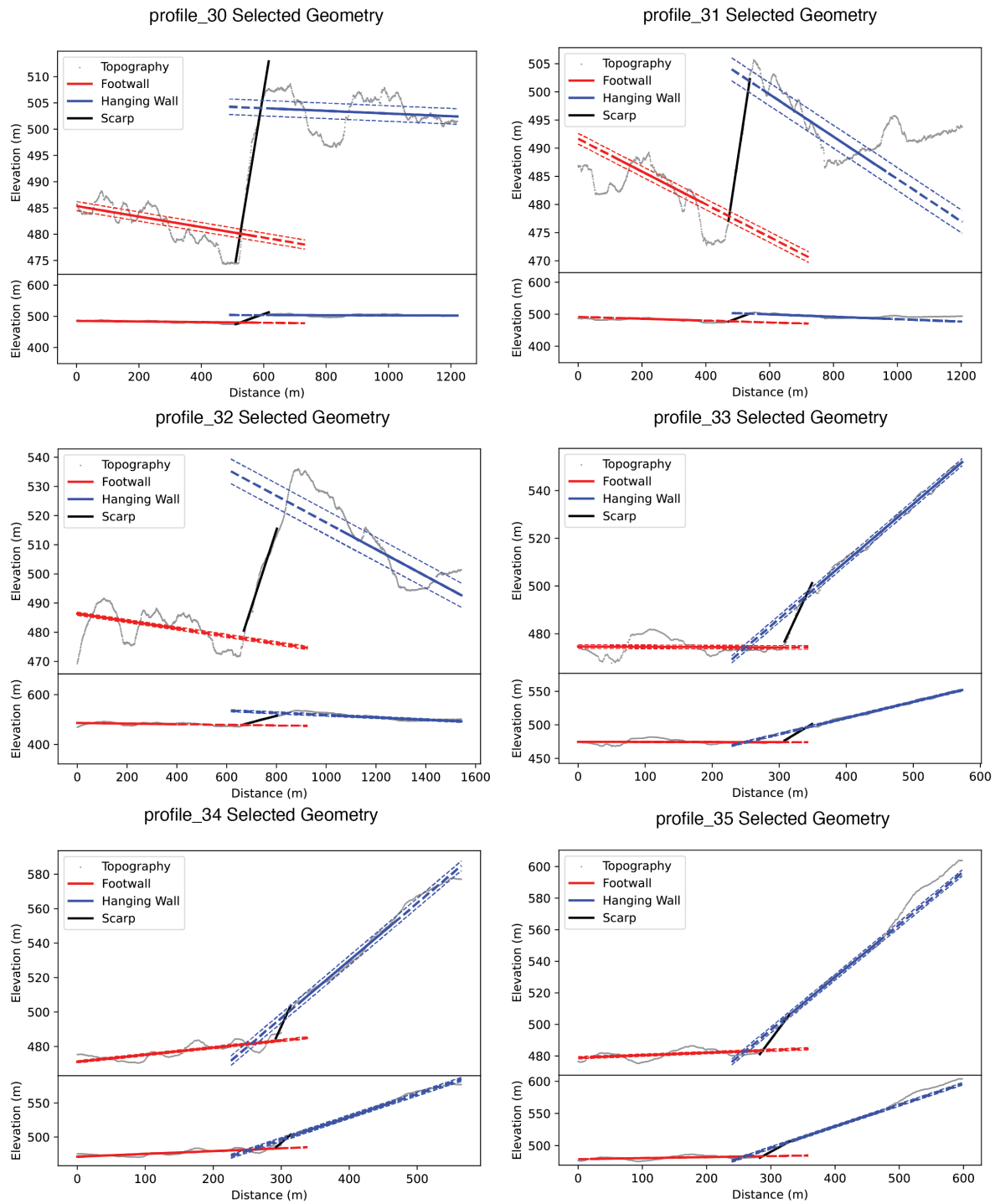


Figure S11: Cross sections for profiles 30–35 from the glacially scoured surface (GSS). Top panel is vertically exaggerated, panel below has no exaggeration. Short dashed lines show 95% error in linear regression fit.

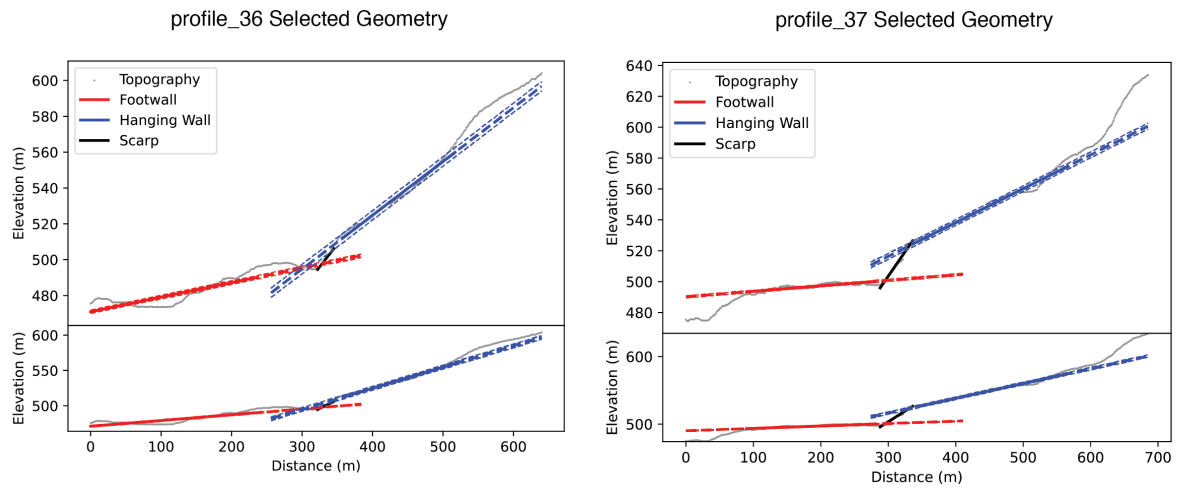


Figure S12: Cross sections for profiles 36–37 from the glacially scoured surface (GSS). Top panel is vertically exaggerated, panel below has no exaggeration. Short dashed lines show 95% error in linear regression fit.

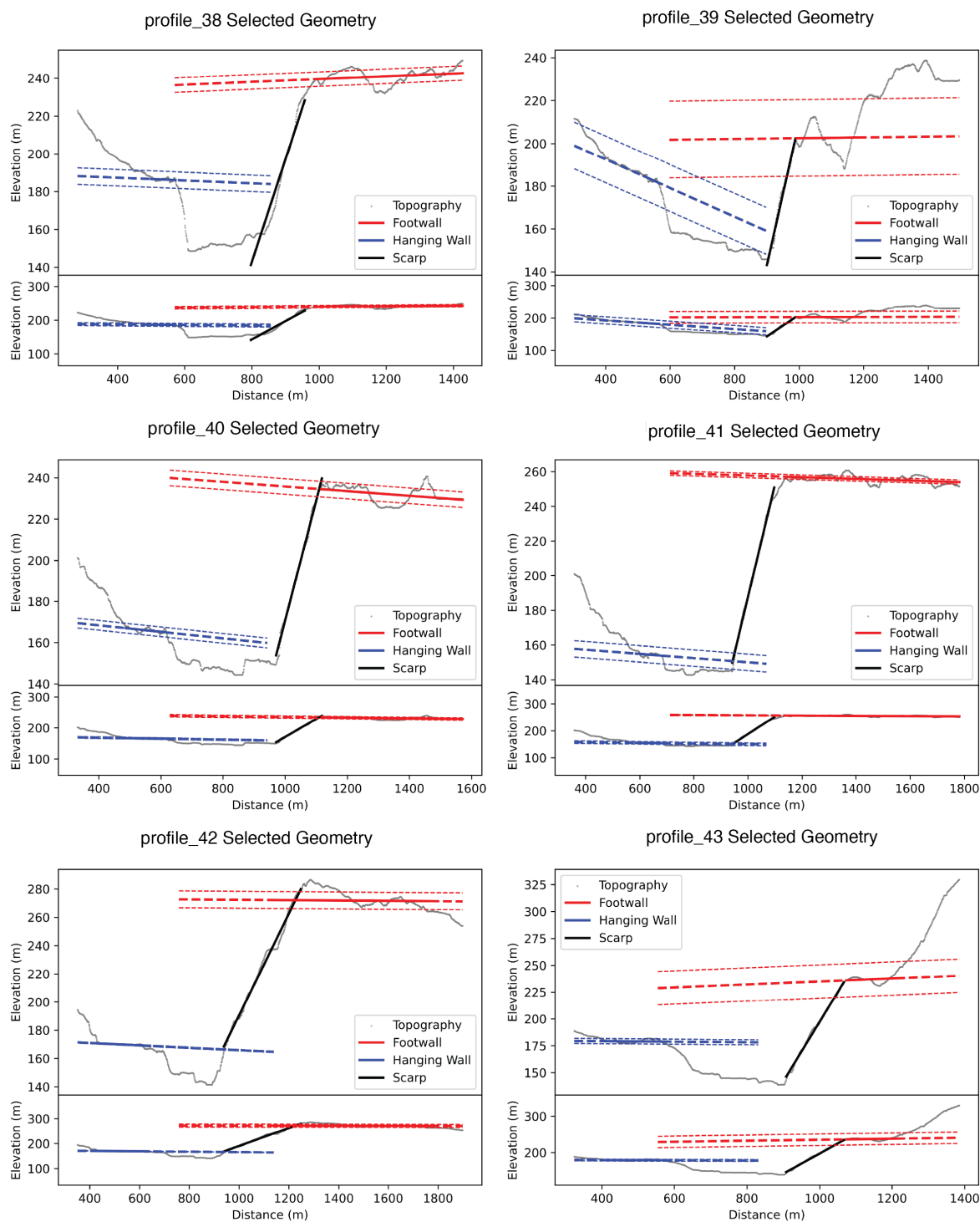


Figure S13: Surface offset profiles 38–43 from Figure 5. Numbering begins in the West and increases eastwards. Top panel is vertically exaggerated, panel below has no exaggeration. Short dashed lines show 95% error in linear regression fit.

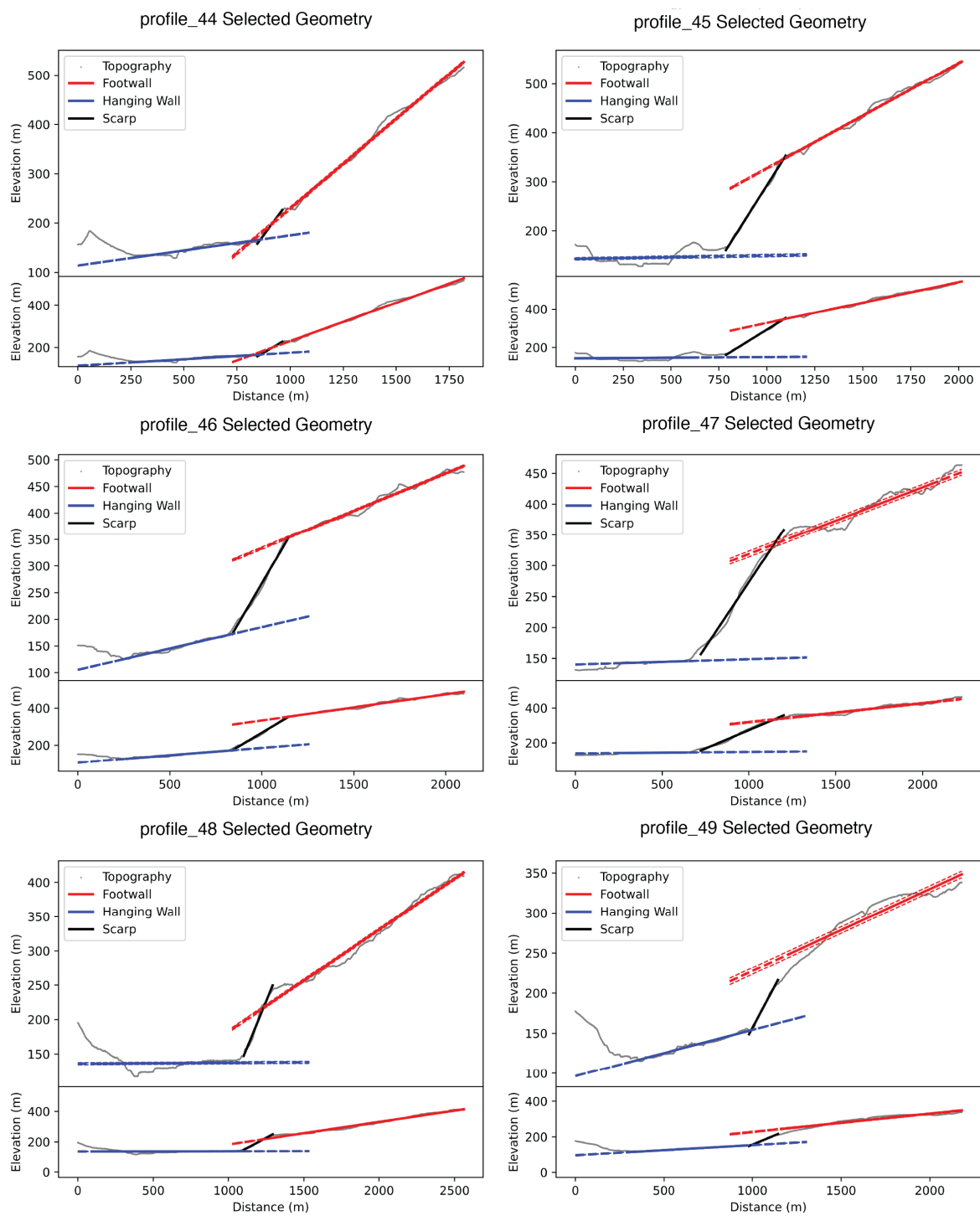


Figure S14: Surface offset profiles 44–49 from Figure 5. Numbering begins in the West and increases eastwards. Top panel is vertically exaggerated, panel below has no exaggeration. Short dashed lines show 95% error in linear regression fit.

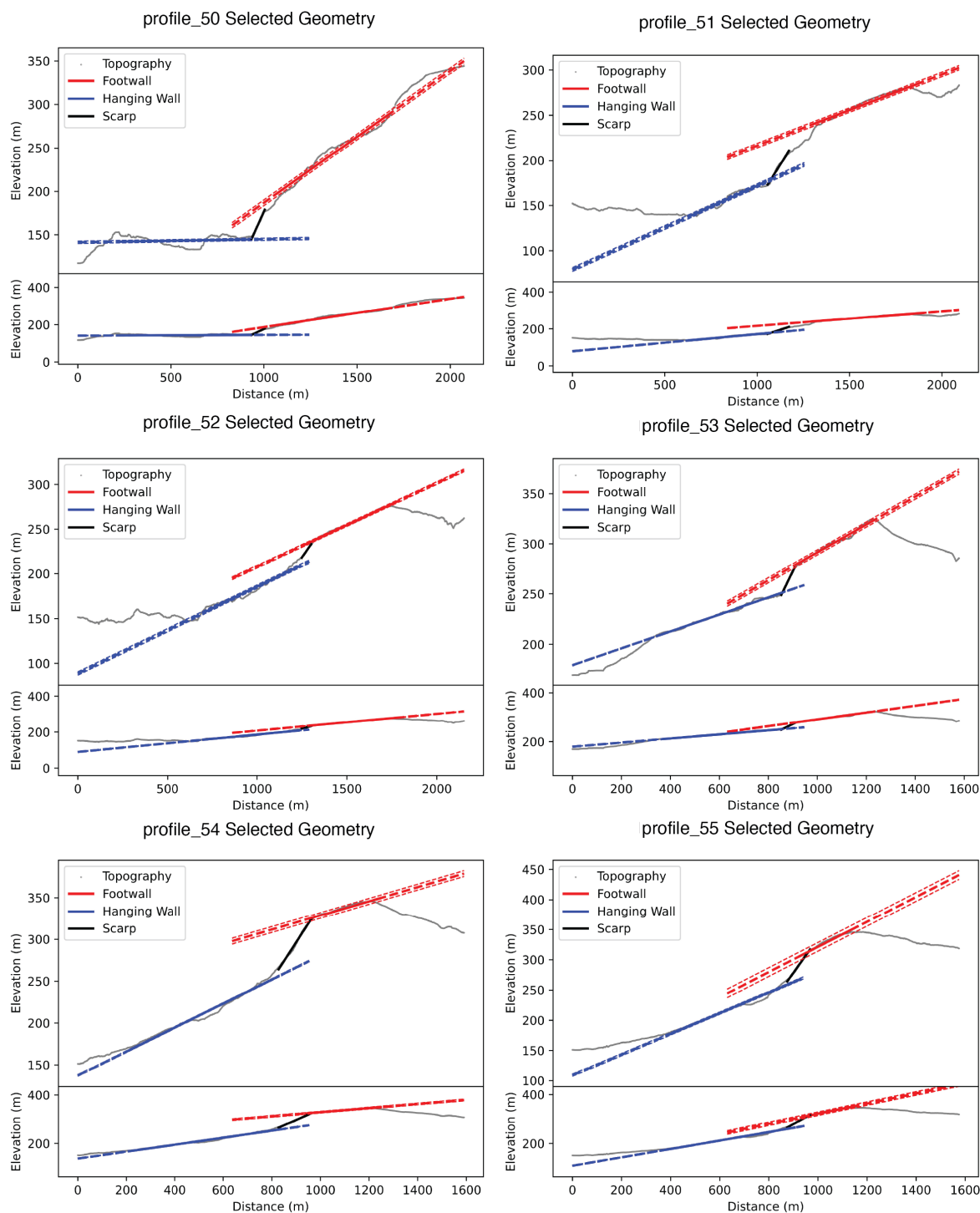


Figure S15: Surface offset profiles 50–55 from Figure 5. Numbering begins in the West and increases eastwards. Top panel is vertically exaggerated, panel below has no exaggeration. Short dashed lines show 95% error in linear regression fit.

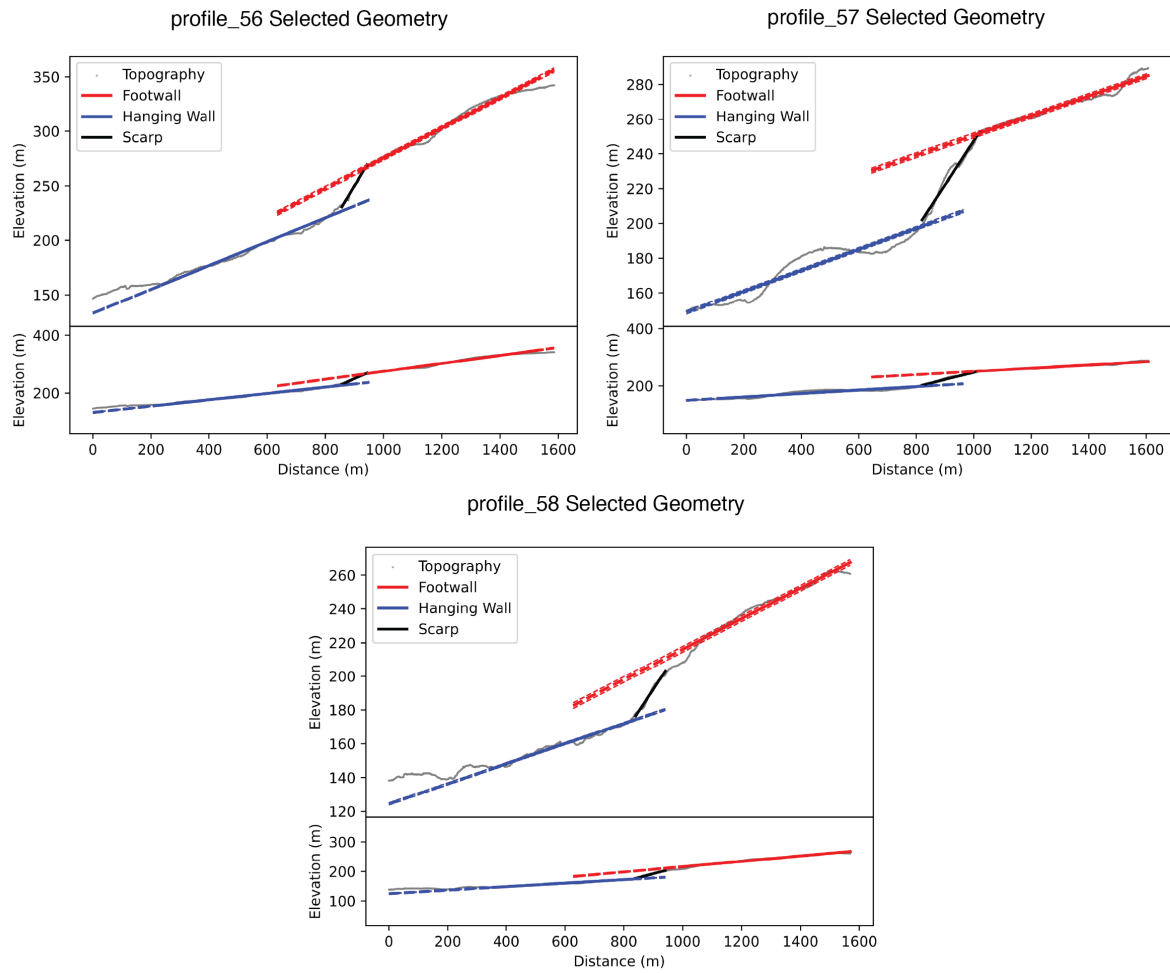


Figure S16: Surface offset profiles 56–58 from Figure 5. Numbering begins in the West and increases eastwards. Top panel is vertically exaggerated, panel below has no exaggeration. Short dashed lines show 95% error in linear regression fit.

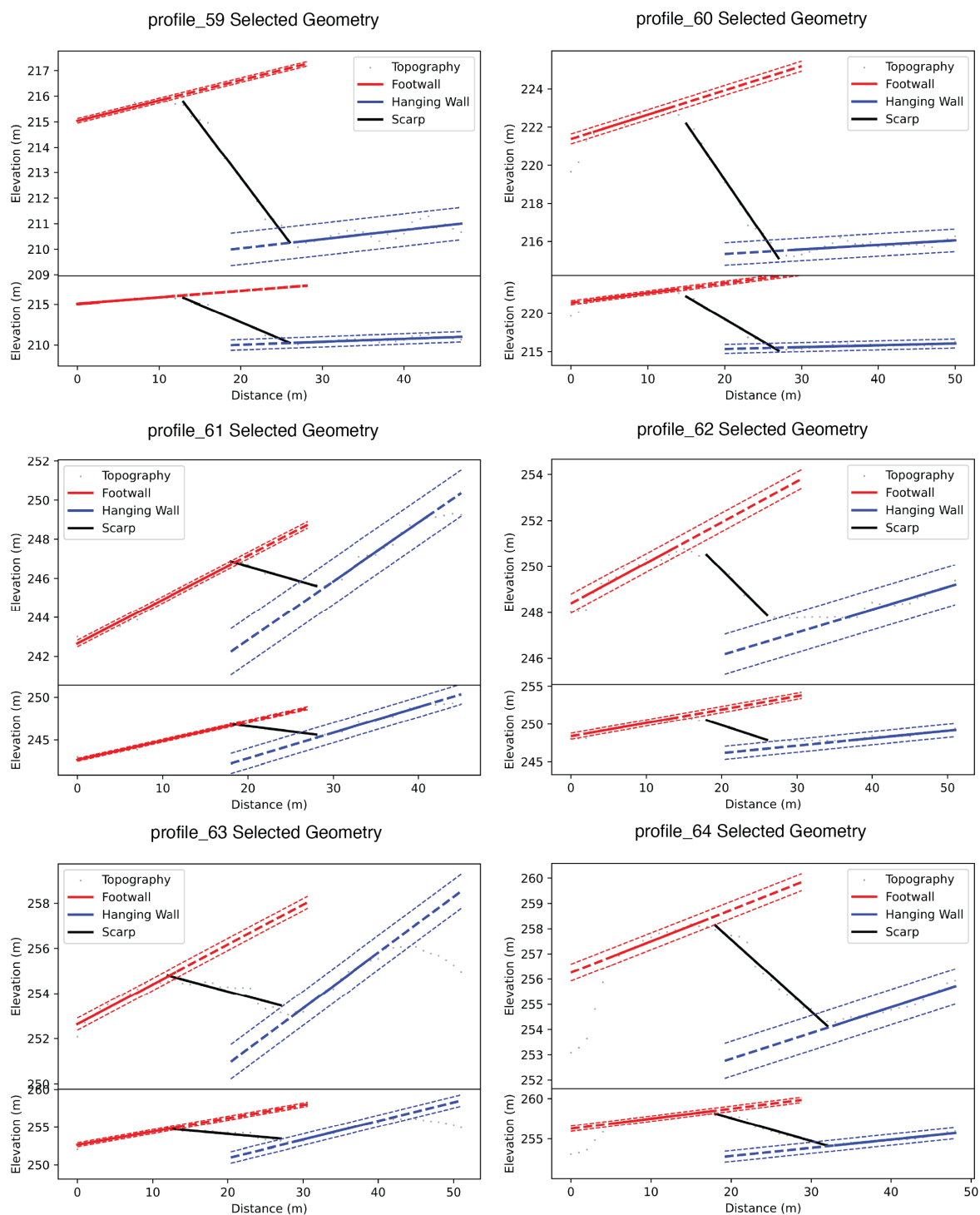


Figure S17: Bedrock offset profiles 59–64 from Figure 5. Numbering begins in the West and increases eastwards. Top panel is vertically exaggerated, panel below has no exaggeration. Short dashed lines show 95% error in linear regression fit.

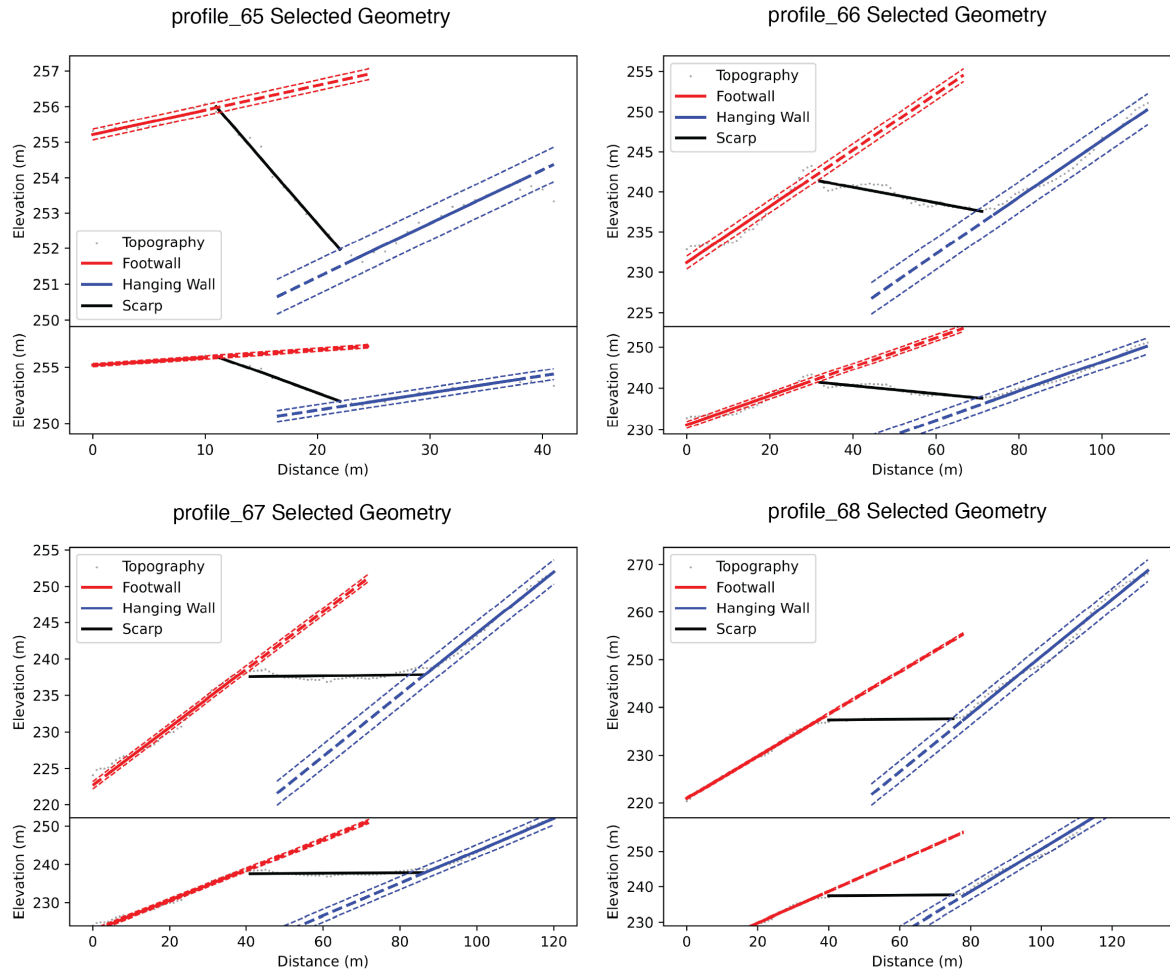


Figure S18: Bedrock offset profiles 65–68 from Figure 5. Numbering begins in the West and increases eastwards. Top panel is vertically exaggerated, panel below has no exaggeration. Short dashed lines show 95% error in linear regression fit.



Figure S19: Photographs from the Schmidt hammer data collection. a) Proceq N-type Schmidt hammer used for data collection. b) Sub-vertical fault shear zone located near the uphill facing scarp. c) Close-up of the serpentinized material. Some near-horizontal slickenlines present. d) Cleaning the surface for Schmidt hammer sampling. e) Taking a sample, most samples were collected from near vertical surfaces along roadsides.