

APPENDIX E: Non-Near-Fault Ground Performance Observations

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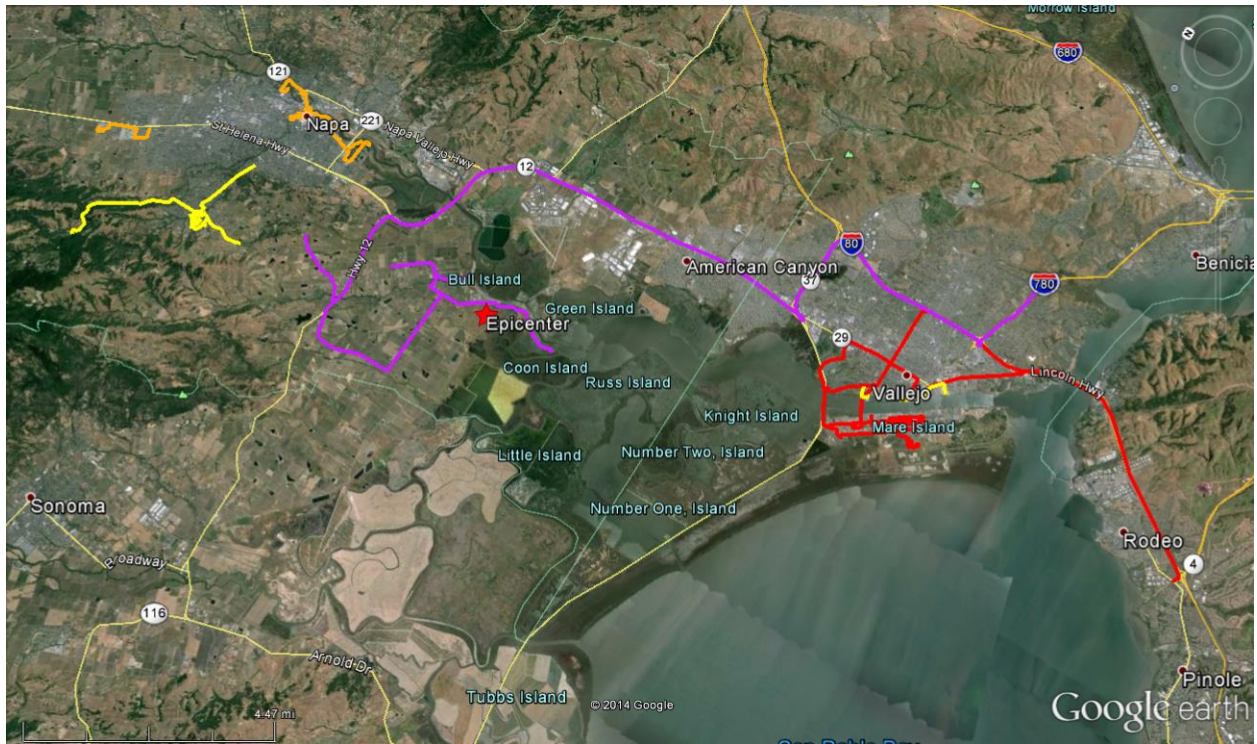


Figure E.1: GPS Track for all GEER teams outside near-fault region [NSF-GEER; 08/24/14]

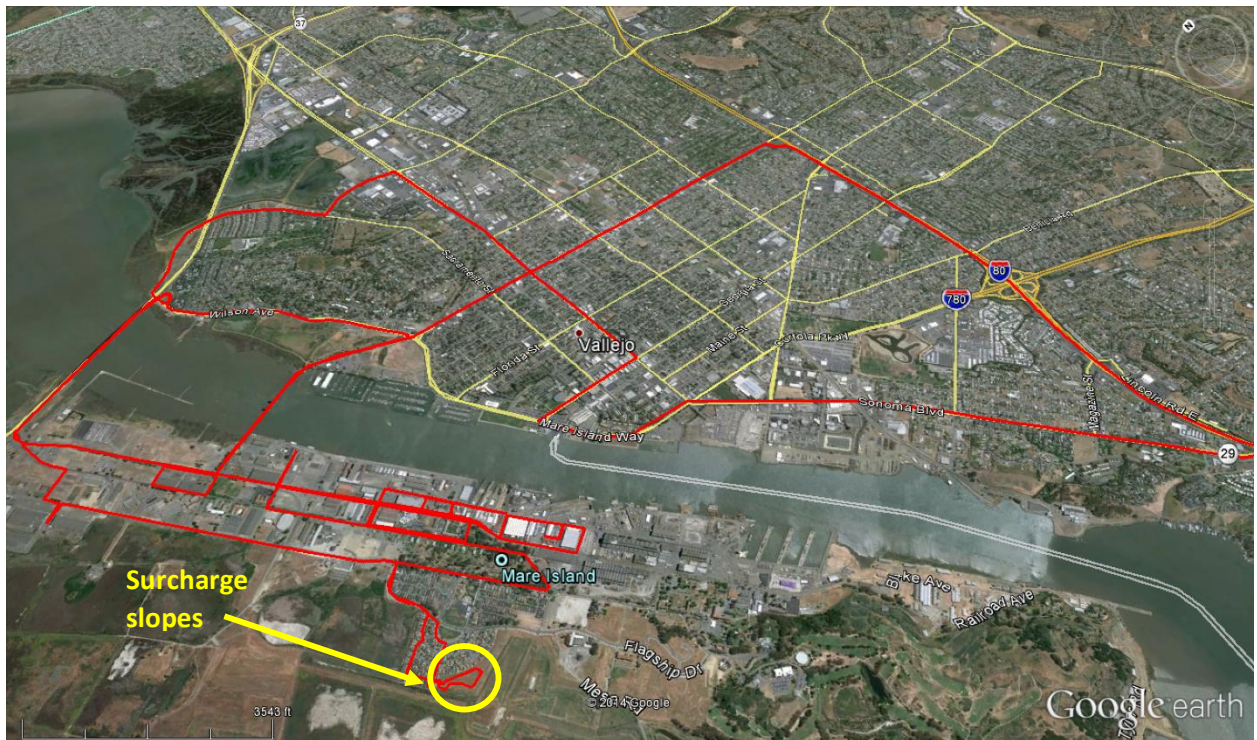


Figure E.2: GPS Track for C. Beyzaei and M. Shiro, Mare Island & Vallejo [NSF-GEER; 08/24/14]

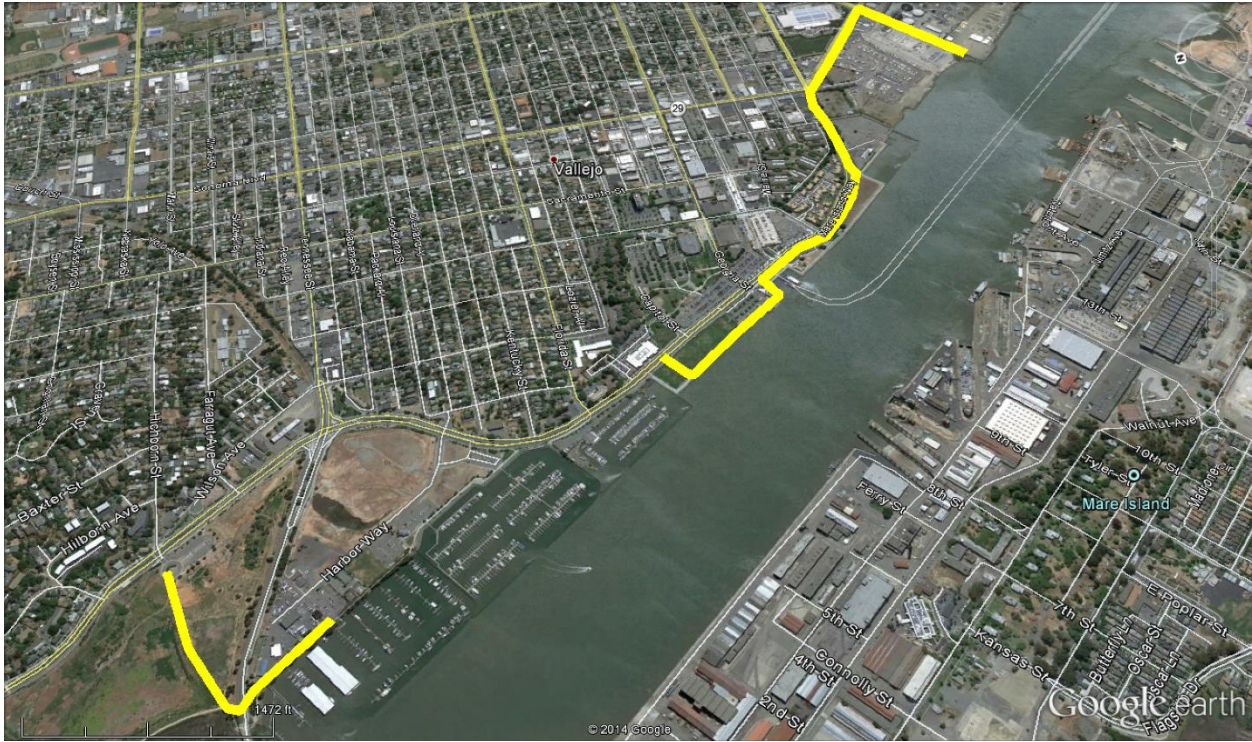


Figure E.3: GPS Track for Gardner and Markham, Vallejo [NSF-GEER; 08/24/14]

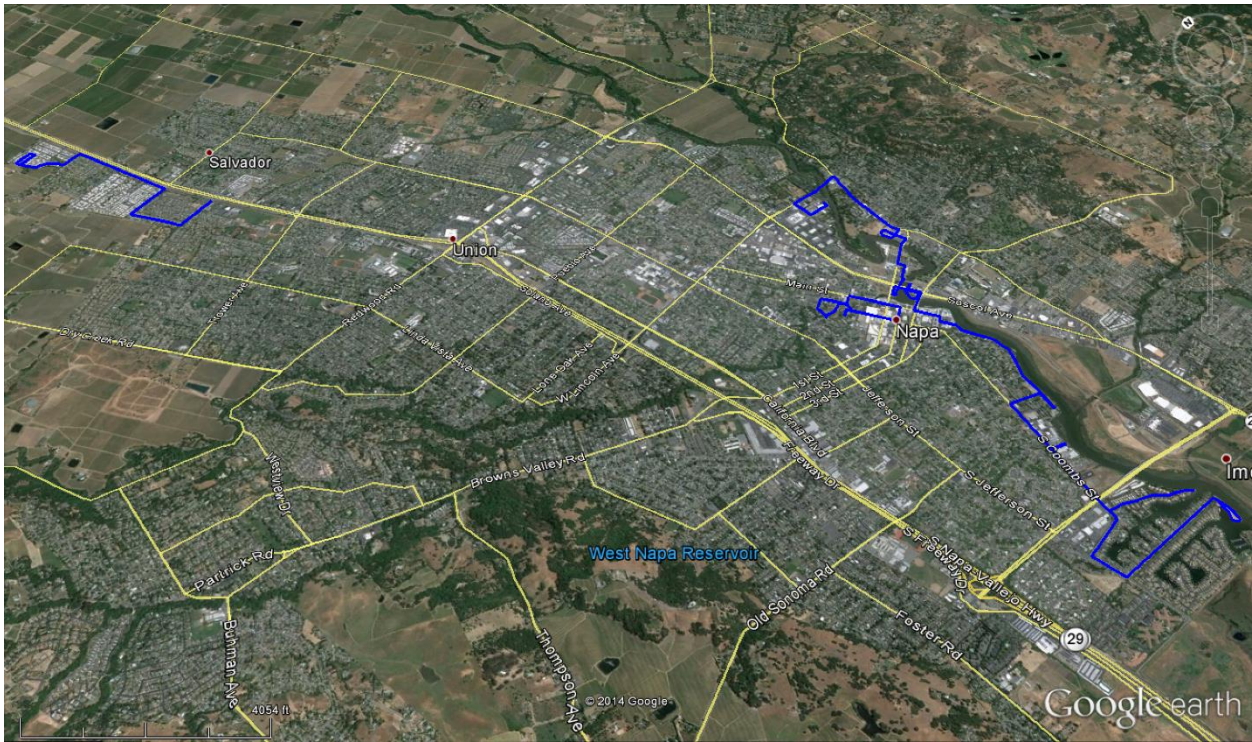


Figure E.4: GPS Track for J. Cohen-Waeber and R. Luque, Napa [NSF-GEER; 08/24/14]

Table E.1: Mare Island Observations – Officers’ Quarters on Walnut Avenue [NSF-GEER: Beyzaei and Shriro; 08/24/14]

Location (listed from north to south)	Damage	Post-Earthquake Classification
Quarters 21	Brick chimney - damaged	Yellow tag
Quarters 29	Brick chimney - damaged	Yellow tag
Quarters 19	Metal chimney - no visible damage	No tag
Quarters 17	Metal chimney - no visible damage	No tag
Quarter F (Island Energy)	Brick chimney - no visible damage	No tag
Quarters P	Brick chimney - no visible damage	No tag
Quarters O	Brick chimney - damaged	No visible tag; caution tape in place across access
Quarters N	Brick chimney - damaged	Yellow tag
Quarters M	Brick chimney - damaged but not lost	Yellow tag
Quarters L	Brick chimney - damaged	Yellow tag
Quarters K	Brick chimney - damaged chimney fell onto and sheared adjacent tree at trunk	Yellow tag
Quarters J	Brick chimney - damage to building concealed by vegetation, but bricks on ground indicated likely loss of chimney	Yellow tag
Quarters A	Brick chimneys - one is damaged	Yellow tag
Quarters B	Metal chimney – no visible damage	Green tag
Quarters C	Metal chimney – no visible damage	Green tag
Quarters D	Metal chimney – no visible damage	Green tag
Quarters E	Brick chimney – damaged	Yellow tag
Quarters G	No visible damage	No tag; access appears unrestricted
Quarters H	Brick chimney – partially damaged	Yellow tag
Saint Peter’s Chapel	No visible damage from outside; Tiffany windows not inspected up close for hairline cracks but no obvious broken windows observed	Access unrestricted; no tag
Walnut Ave.	Paving stones loose in areas of the sidewalk	Possibly earthquake related

Table E.2: Mare Island Observations – Historic Core [NSF-GEER: Beyzaei and Shriro; 08/24/14]

Location	Observation
Building 87	Looks OK (west side, on Nimitz Ave)
Building 71	Looks OK (maybe some minor cracks reopened)
Building 69 (?)	Looks OK
Building 273	Broken glass windows, likely not earthquake related
Building 571	Green and white building, corrugated sheet metal siding was deformed with some damage to roll-up door on opposite side of siding damage; white building next to 571 appeared undamaged
Building 47	Looks OK
Building 65	Looks OK (minor cracks might be earthquake related)
Building 52	Some bricks have fallen from the large circular window, otherwise undamaged; similar façade to Building 106 but it didn’t fail

Building 126	@ Nimitz & Rickover intersection; most pronounced surface effects seen on Mare Island are the uplifted asphalt at the hydrant and possible surface cracking; water flowing out of pipe from building – had significantly decreased flow about an hour later (water line breaks within the building); roll-up door damaged
Building 106	Major masonry (brick) damage
Building 113	Looks OK, including hydrant in front of the building
Building 116	Looks OK (some broken glass on the ground)
Building 118	Major masonry (brick) damage on all sides but top façade appears undamaged; red-tagged; concrete façade on columns has buckled off
Building 114	Major masonry (brick) damage, including top façade
Building 112	Corrugated roll-up doors damaged, sprinkler system/water line breaks inside the building
Building 165	Looks OK (under construction, vertical cracks in wood columns might be earthquake related or due to construction, no bricks on the ground)
Dry dock	Undamaged according to security guard at Shipyard Gate 1 (he noted that there had been major shaking but no noticeable damage)

Table E.3: Vallejo Waterfront Observations [NSF-GEER: Gardner and Markham; 08/24/14]

Location	Observation
N38.111°, W122.271°	No indicators of any lateral spreading or EQ induced displacement (Vallejo Marina, up to Ferry Terminal)
N38.097°, W122.258°	Broken waterline along Mare Island Way
N38.093°, W122.254°	Broken waterline in Kiewit Vallejo yard

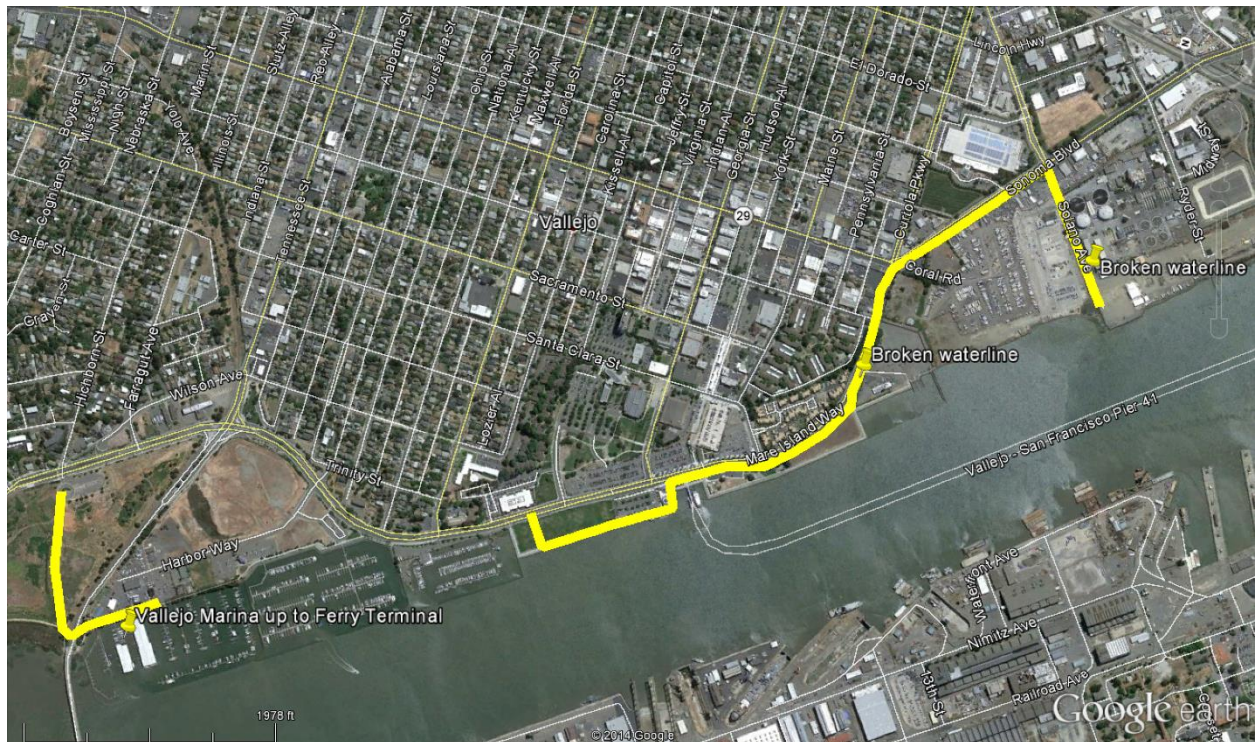


Figure E.5: Vallejo Waterfront Observation Locations [NSF-GEER: Gardner and Markham; 08/24/14]



Figure E.6: Corrugated siding damage [NSF-GEER; GPS N38.111 W122.282; 08/24/14; 13:53]



Figure E.7: Corrugated siding, no damage [NSF-GEER; GPS N38.110 W122.283; 08/24/14; 13:54]



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Figure E.9: Brick chimney damage [NSF-GEER; GPS N38.099 W122.273; 08/24/14; 14:19]



Figure E.10: Metal chimney, no damage [NSF-GEER; GPS N38.097 W122.272; 08/24/14; 17:06]



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Figure E.12: Brick facade damage [NSF-GEER; GPS N38.095 W122.268; 08/24/14; 15:38]



Figure E.13: Possible earthquake damage [NSF-GEER; GPS N38.098 W122.269; 08/24/14; 14:37]



Figure E.14: Pavement damage at hydrant [NSF-GEER; GPS N38.098 W122.269; 08/24/14; 14:39]



Figure E.15: Pavement damage at hydrant [NSF-GEER; GPS N38.098 W122.269; 08/24/14; 14:37]



Figure E.16: Pavement damage along concrete [NSF-GEER; GPS N38.098 W122.269; 08/24/14; 14:38]



Figure E.17: Pavement damage at concrete corner [NSF-GEER; GPS N38.098 W122.269; 08/24/14; 14:38]



Figure E.18: Hydrant, no damage [NSF-GEER; GPS N38.097 W122.268; 08/24/14; 14:51]



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Figure E.21: Surcharge slope, no damage [NSF-GEER; GPS N38.092, W122.277; 08/24/14; 17:49]



Figure E.22: Slope, no damage [NSF-GEER; GPS N38.092 W122.277; 08/24/14; 17:50]



Figure E.23: Slopes, no damage [NSF-GEER; GPS N38.092 W122.277; 08/24/14; 17:53]



Figure E.24: Surcharge slope, no damage [NSF-GEER; GPS N38.092 W122.277; 08/24/14; 17:51]



Figure E.25: Highway 37 Bridge pier, no damage [NSF-GEER; GPS N38.122 W122.276; 08/24/14; 18:24]



Figure E.26: Water main break at Napa Valley Mobile Home Park [NSF-GEER; N 38.3465 W -122.330; 08/24/14 10:39]



Figure E.27: Water main break at Brown St. (Downtown Napa) [NSF-GEER; N 38.3016 W -122.288; 08/24/14 18:24]



Figure E.28: Water break at Arroyo Dr. (Downtown Napa). Soil below asphalt ejected by water. [NSF-GEER; N 38.3008 W -122.289; 08/25/14 18:34]



Figure E.29: Lincoln Bridge. No damage was observed. [NSF-GEER; N 38.311 W -122.278; 08/25/14 12:02]



Figure E.30: 1st St. Bridge. No damage observed. [NSF-GEER; N 38.3023 W -122.2794; 08/25/14 12:26]



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Figure E.34: Failure of the stone retaining wall in South abutment of Soscol Bridge [NSF-GEER; N 38.2994 W -122.282; 08/24/14 13:44]



Figure E.35: Crack parallel to the River in North abutment of Soscol Bridge [NSF-GEER; N 38.2997 W -122.283; 08/24/14 13:09]



Figure E.36: Movement of the deck in 3rd St. Bridge East abutment [NSF-GEER; N 38.2981 W -122.284; 08/24/14 14:44]

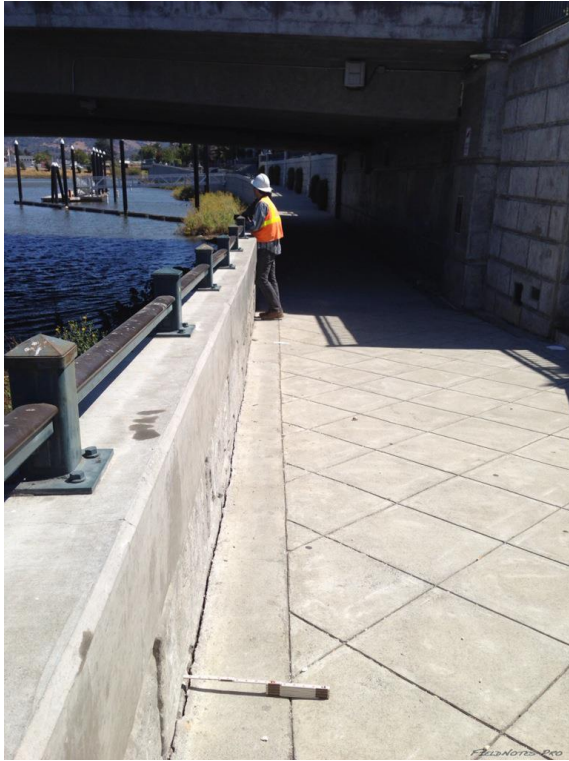


Figure E.37: Crack parallel to the River in West abutment of 3rd St. Bridge [NSF-GEER; N 38.2980 W -122.2840; 08/24/14 14:44]



Figure E.38: of the deck in 3rd St. Bridge East abutment [NSF-GEER; N 38.2981 W -122.284; 08/24/14 14:44]



Figure E.39: Ground cracking due to liquefaction in Napa River point bar below 3rd St. Bridge, between the two columns of the eastern pier. [NSF-GEER; N 38.2980 W -122.2840; 08/24/14 14:44]



Figure E.40: Ground cracking and settlement due to liquefaction in Napa River point bar below 3rd St. Bridge [NSF-GEER; N 38.2980 W -122.2840; 08/24/14 14:44]



Figure E.41: Settlement of backfill near the retaining wall in the Pedestrian Bridge [NSF-GEER; N 38.3003 W -122.2881; 08/24/14 17:58]



Figure E.42: Crack in pavement behind the retaining wall in the Pedestrian Bridge [NSF-GEER; N 38.3003 W -122.2881; 08/24/14 17:58]



Figure E.43: Crack along sheet pile wall behind the retaining wall in the Pedestrian Bridge [NSF-GEER; N 38.3003 W -122.2881; 08/24/14 17:58]



Figure E.44: Step between bridge's deck and access ramp in North abutment. [NSF-GEER; N 38.3003 W -122.2881; 08/24/14 17:58]

Table E.4: Description of damage observed in bridges

Bridge	Damage Observed
Lincoln Bridge	No damage observed
1st St. Bridge	No damage observed
Railroad bridge	North and south abutment: Cracks in the interface between foundation of abutment and soil oriented in both directions; perpendicular and parallel to the river.
Soscol Bridge	South abutment: Failure of masonry retaining. Fissure of the soil was observed in the EW direction, parallel to the river. Settlement of the street was observed relative to the deck of the bridge. North abutment: Crack parallel to the river bank was observed.
3rd St. Bridge	West abutment: About 0.75" displacement between walkway and retaining wall. Bridge deck was displaced about 2" in the E-W direction. The expansion joint connecting the deck to the road shows a widened gap by about 2 inches. East abutment: About 2" of displacement of the bridge deck was observed. Point River sand deposit below bridge: In the natural soil bank formed in the east side of the bridge are localized two large columns that support the bridge's deck. Around these columns, ground cracks due to liquefaction were observed. It was also apparent that the soil had settled respect to the pier. The settlement measured was between 5 and 25 cm. No sand boil was observed but cracks with very fine silty sand was observed. The cracks were spaced every 25 to 30 cm in a radial pattern around the bridge piers. Ground cracking was also observed south and north of the bridge and the cracks were always oriented parallel to the shore.
Pedestrian Bridge (Coombs St)	This bridge crosses the Napa creek, not the Napa River. South abutment: The south abutment of the pedestrian bridge is founded on the backfill of a large retaining wall (H ≈ 3m). About 1.5 meters away from the retaining wall it was found a sheet pile wall. Along this sheet pile wall cracks were observed. To the north, on Coombs St, a large radial crack was observed 4 meters away from the retaining wall, suggesting a backfill failure. Adjacent to the wall 30 cm settlement was measured. North abutment: The bridge deck is raised approximately 15 cm above the north abutment and ramp. Cracks parallel to the creek were observed in the parking lot pavement and around the North abutment.

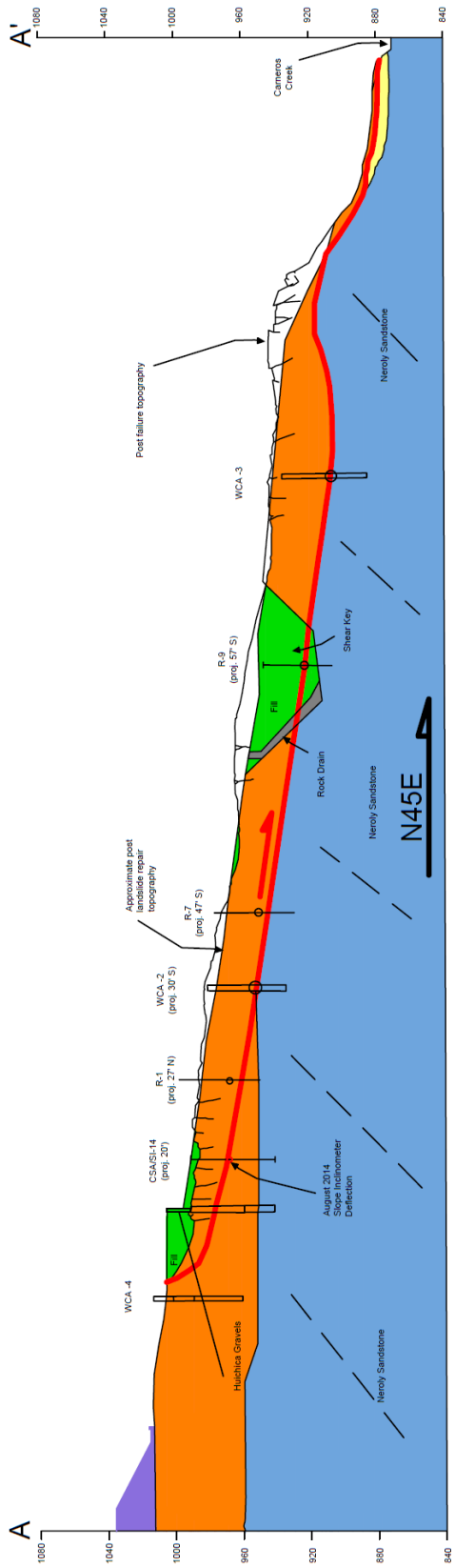


Figure E.45: Napa winery cross-section

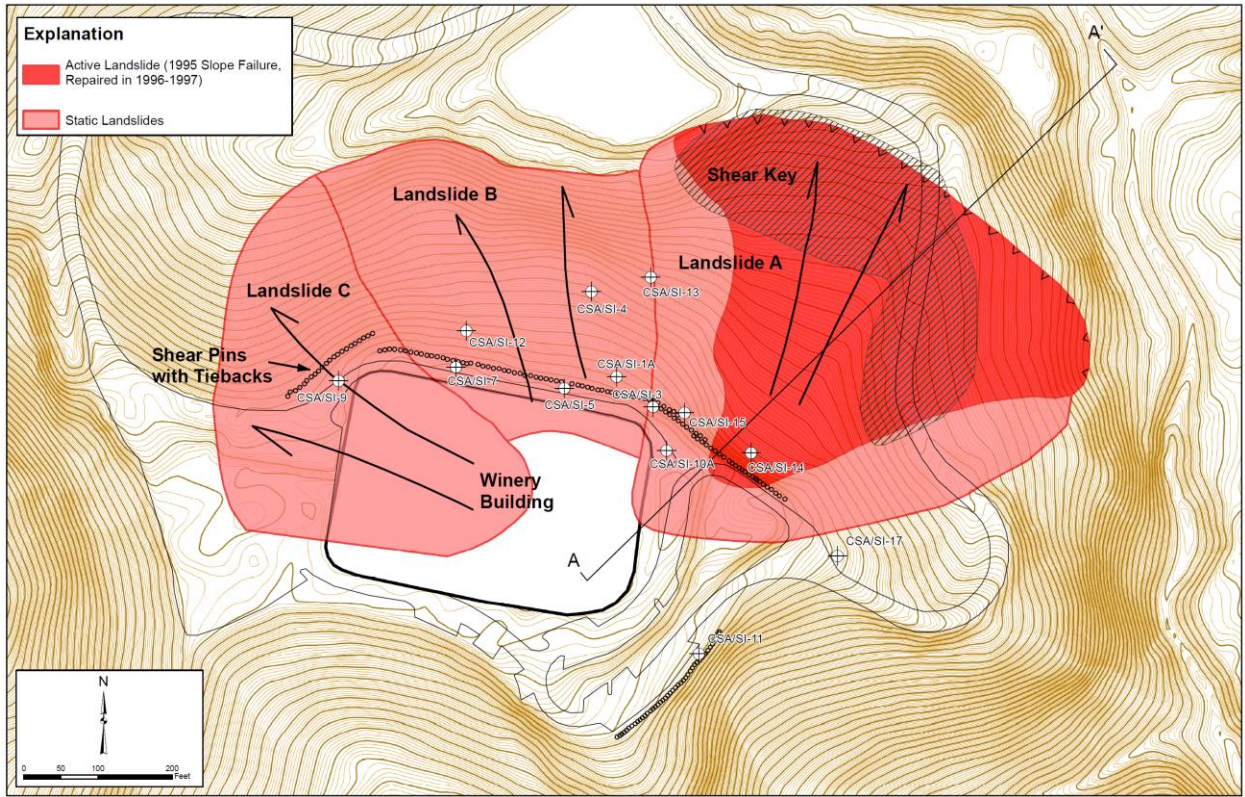


Figure E.46: Napa winery overview map

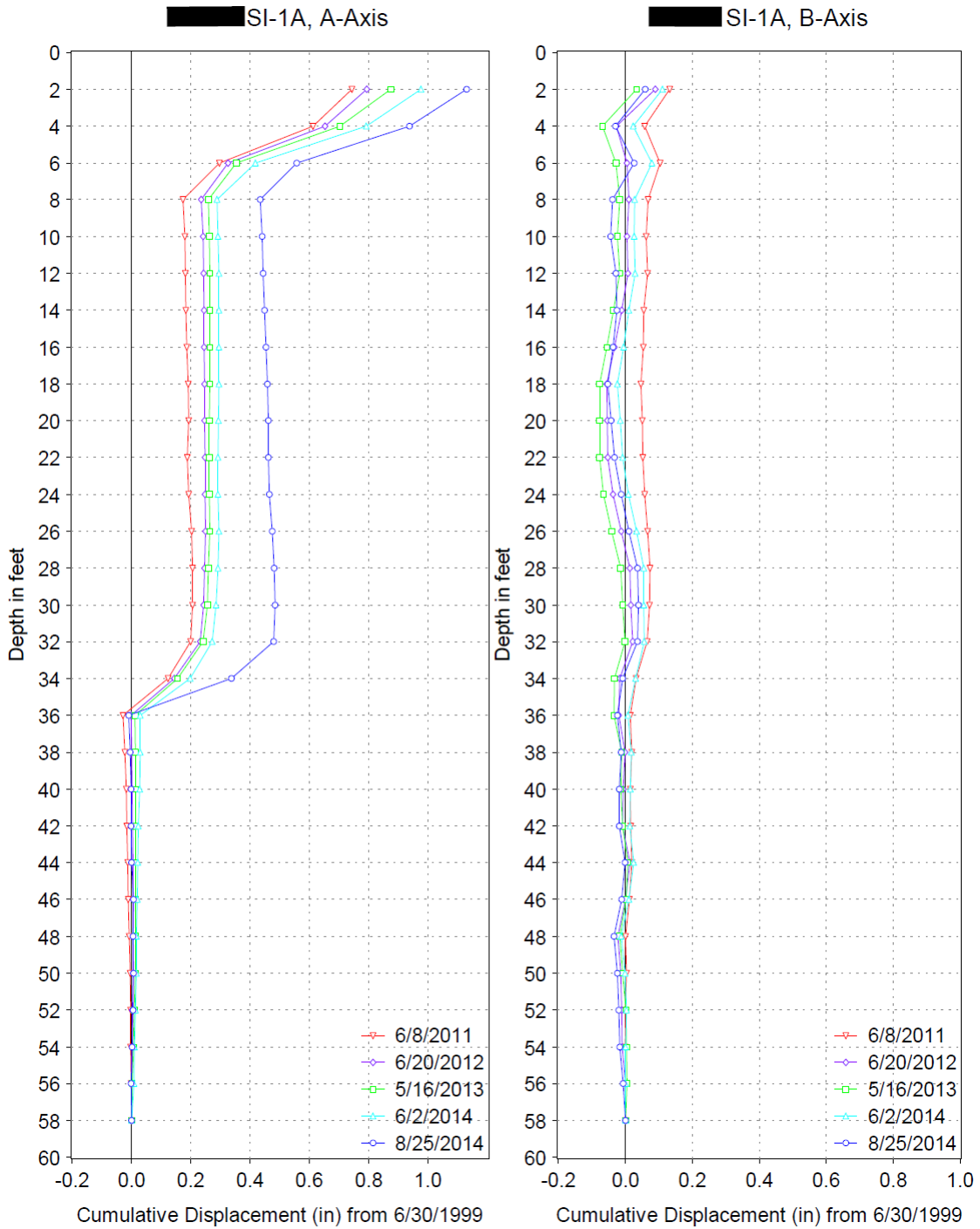


Figure E.47: Napa winery slope inclinometer data, SI-1A

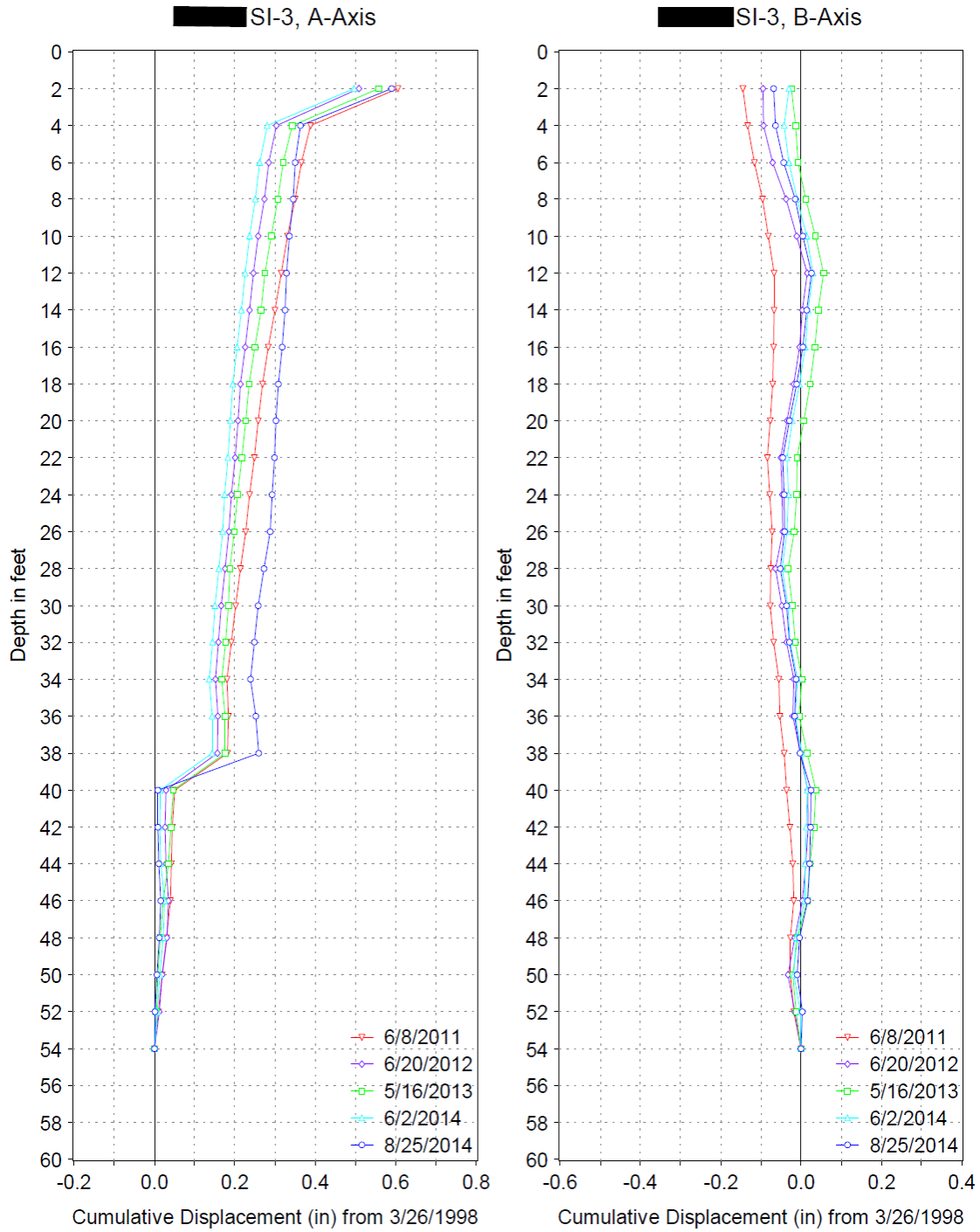


Figure E.48: Napa winery slope inclinometer data, SI-3

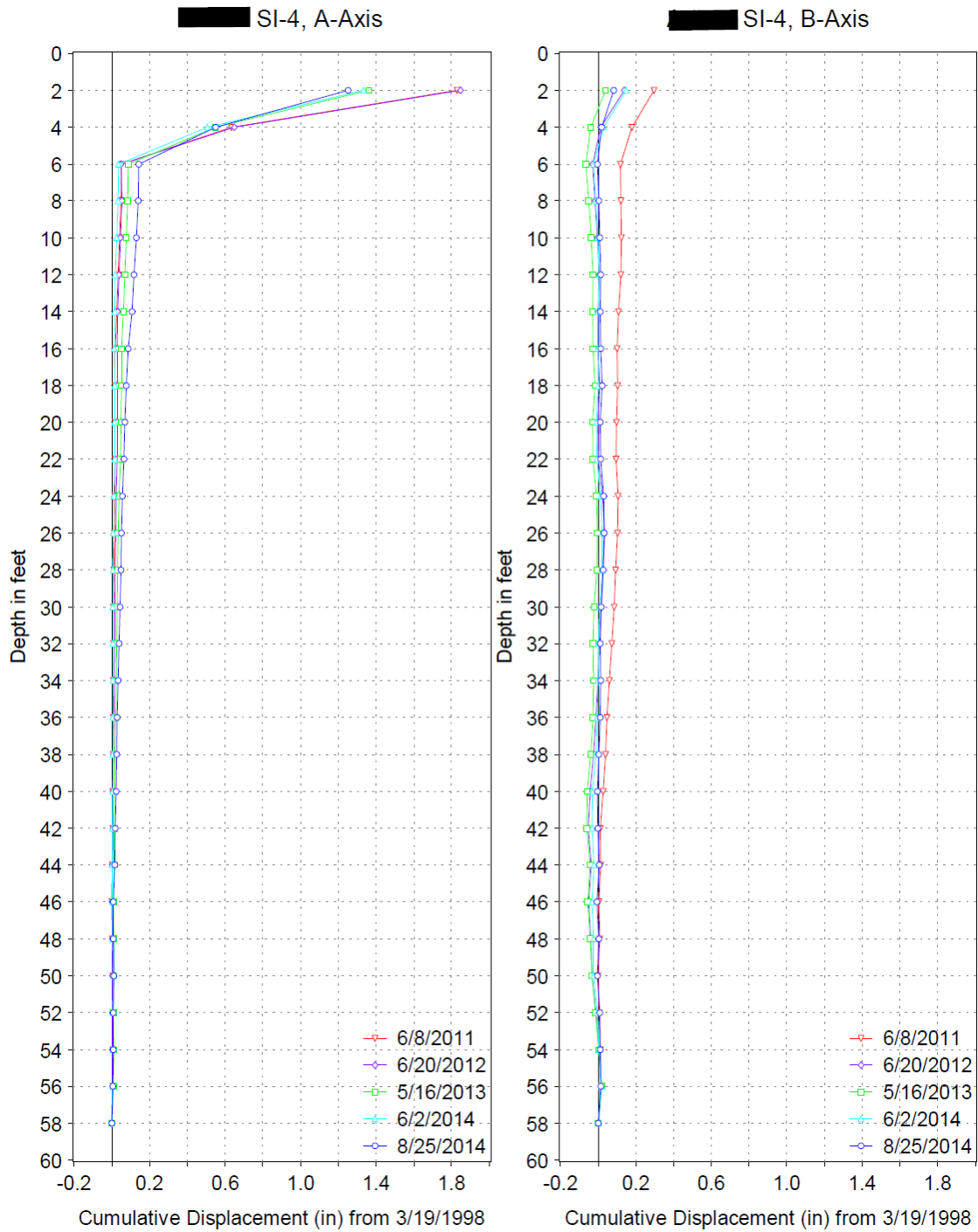


Figure E.49: Napa winery slope inclinometer data, SI-4

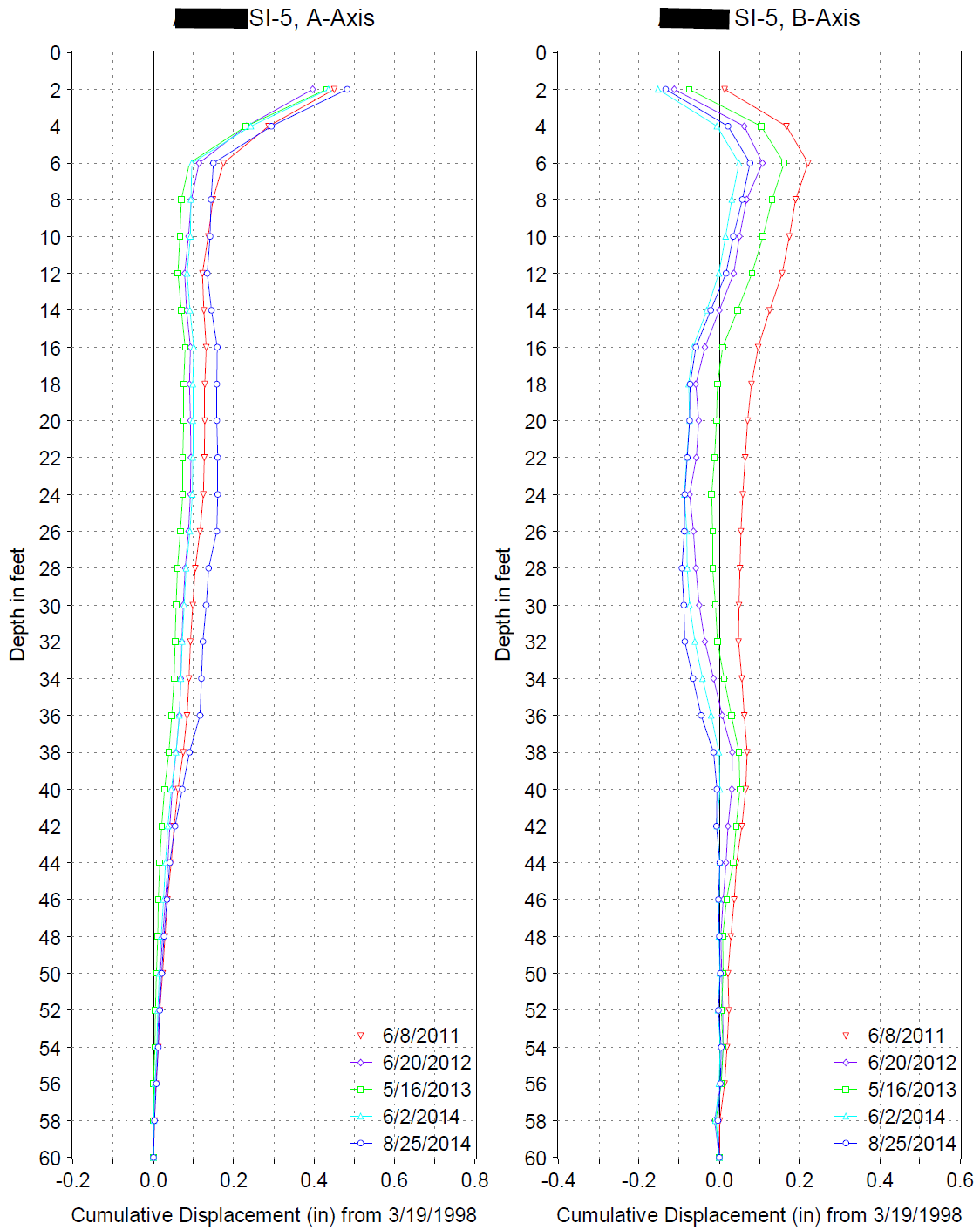


Figure E.50: Napa winery slope inclinometer data, SI-5

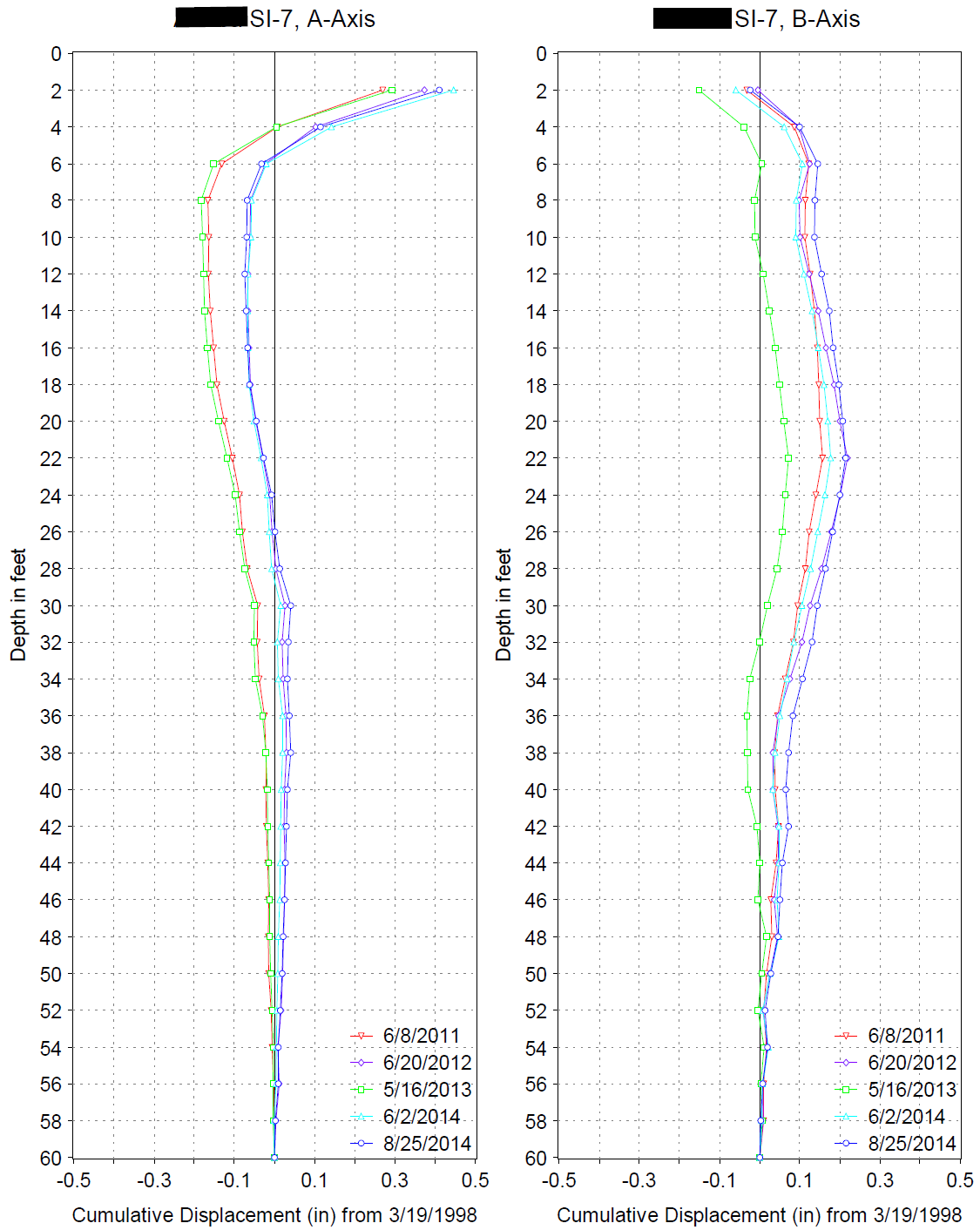


Figure E.51: Napa winery slope inclinometer data, SI-7

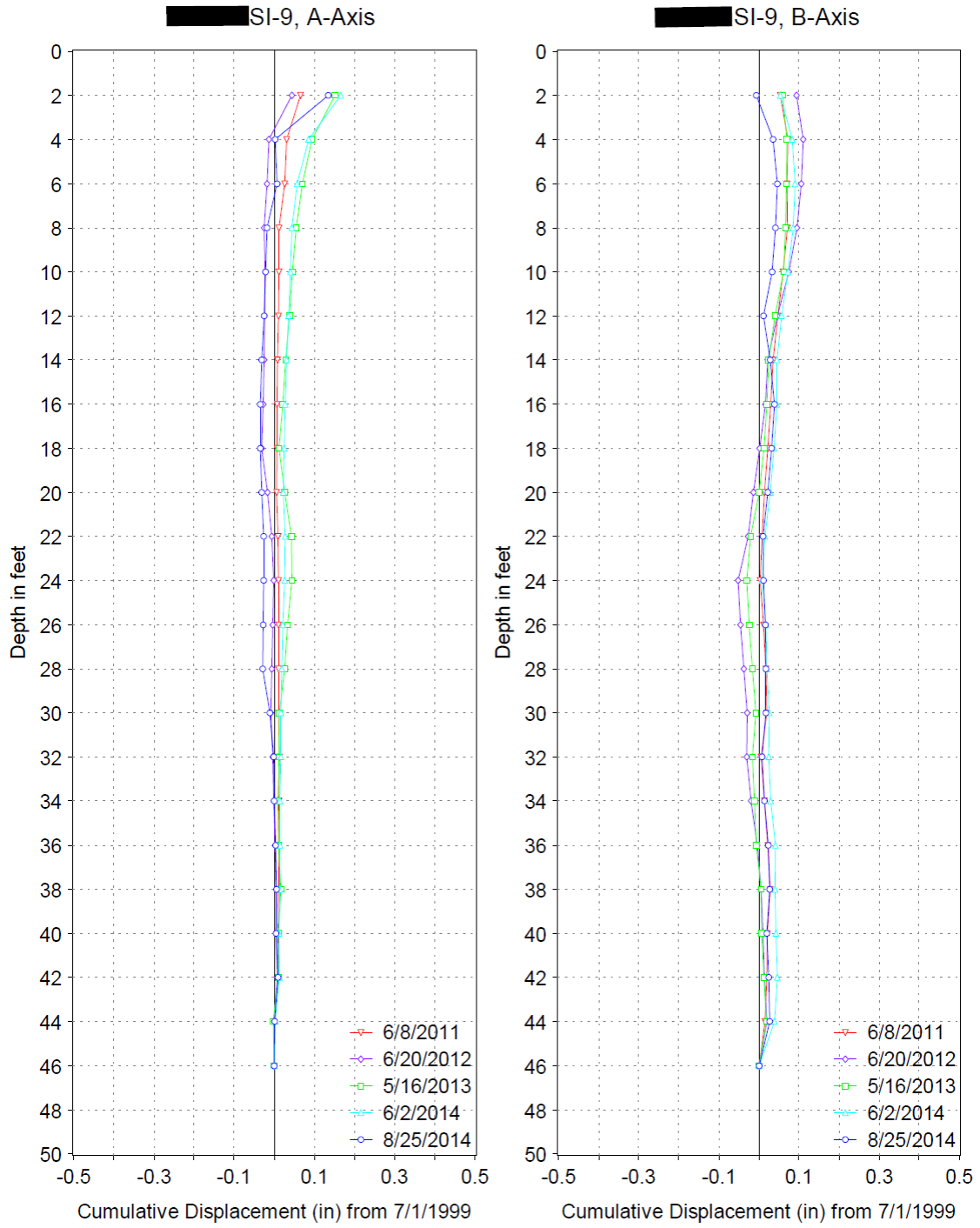


Figure E.52: Napa winery slope inclinometer data, SI-9

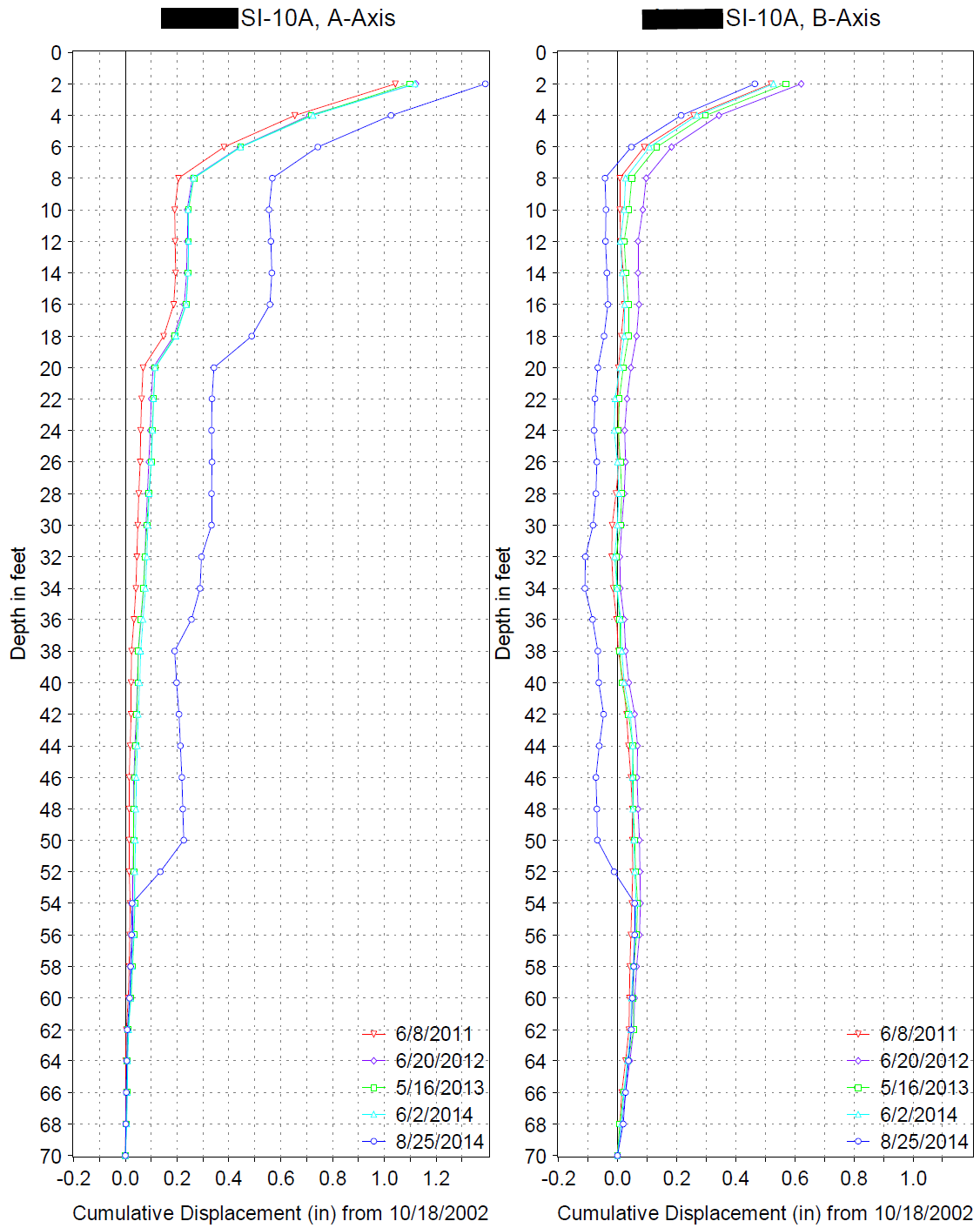


Figure E.53: Napa winery slope inclinometer data, SI-10A

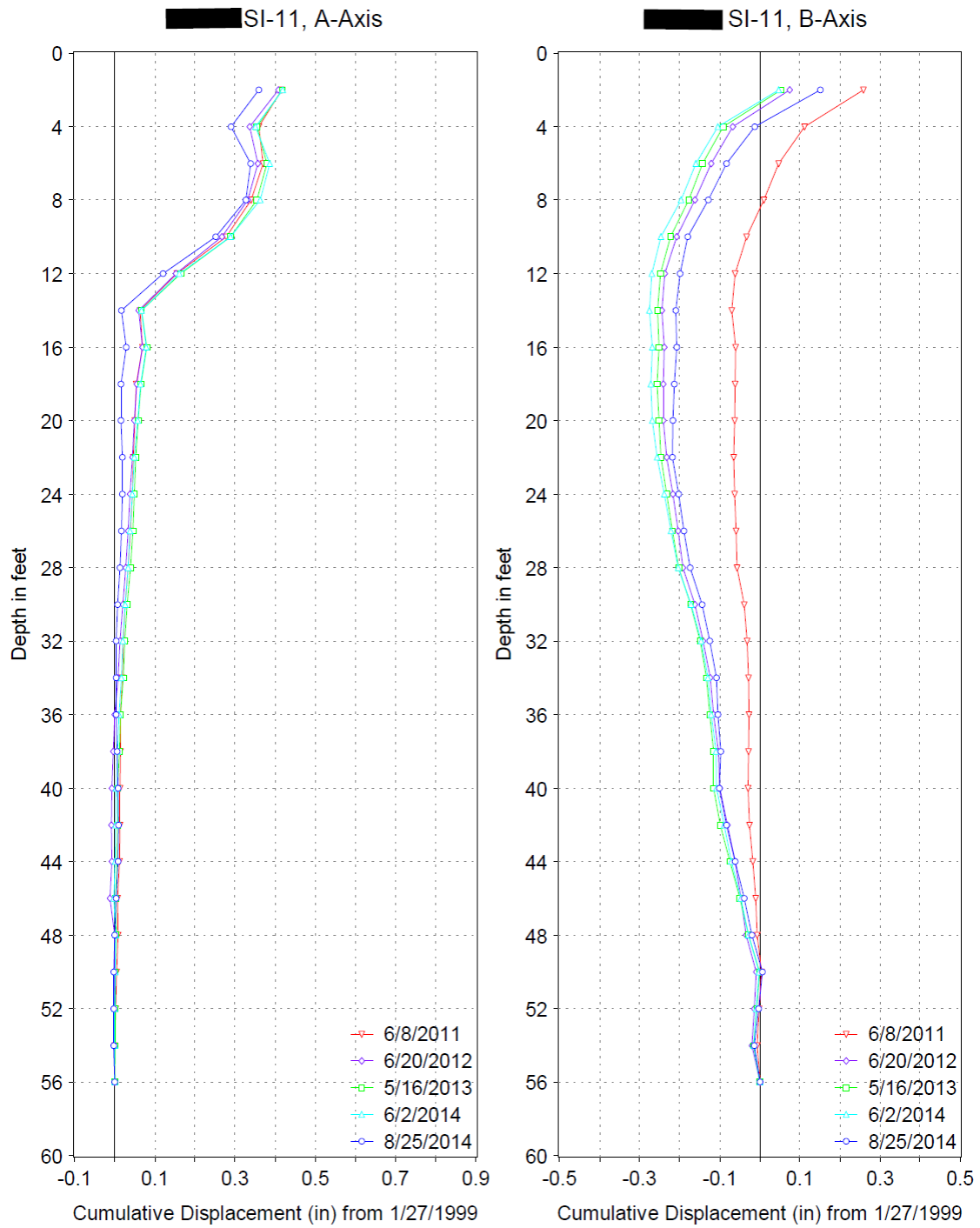


Figure E.54: Napa winery slope inclinometer data, SI-11

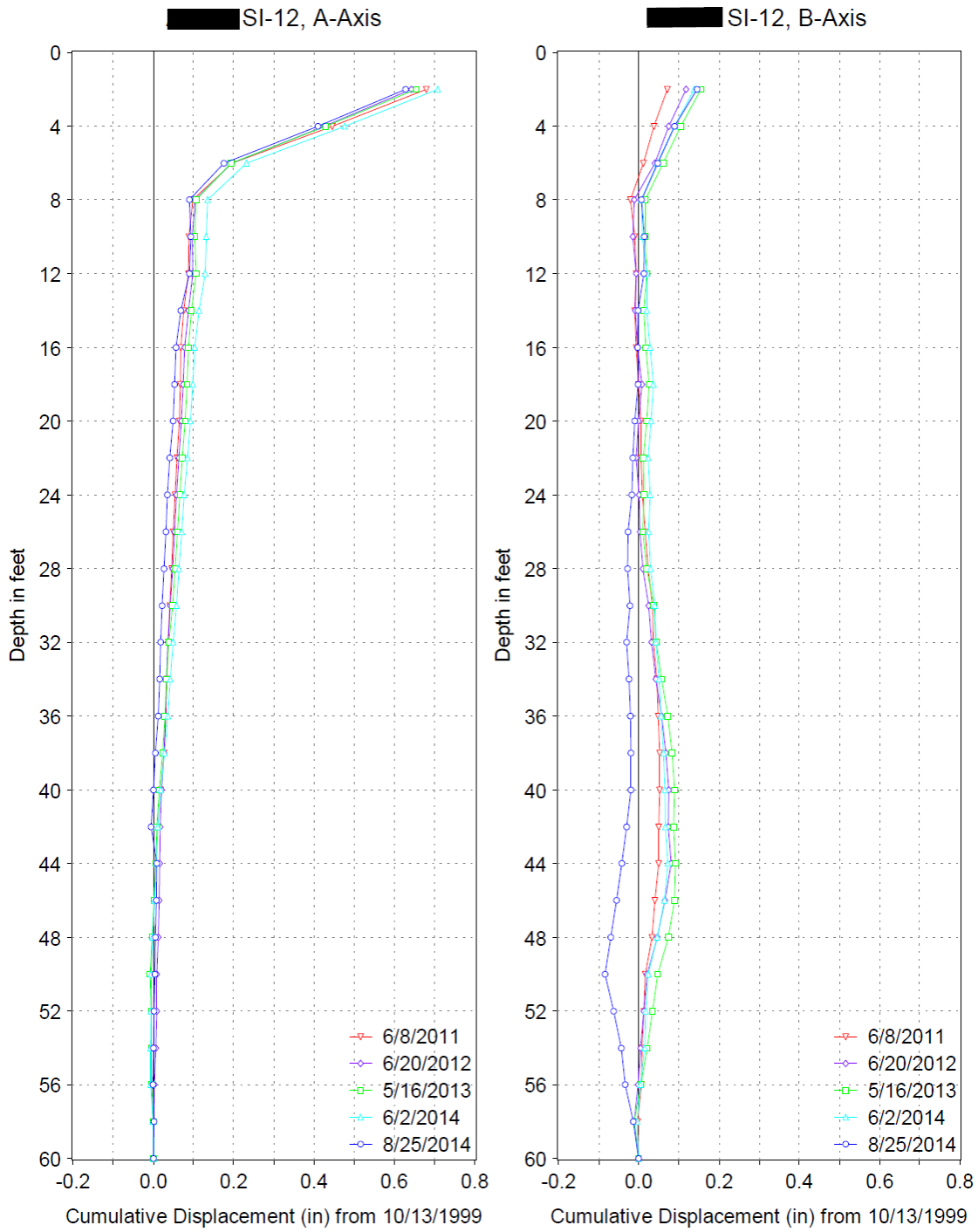


Figure E.55: Napa winery slope inclinometer data, SI-12

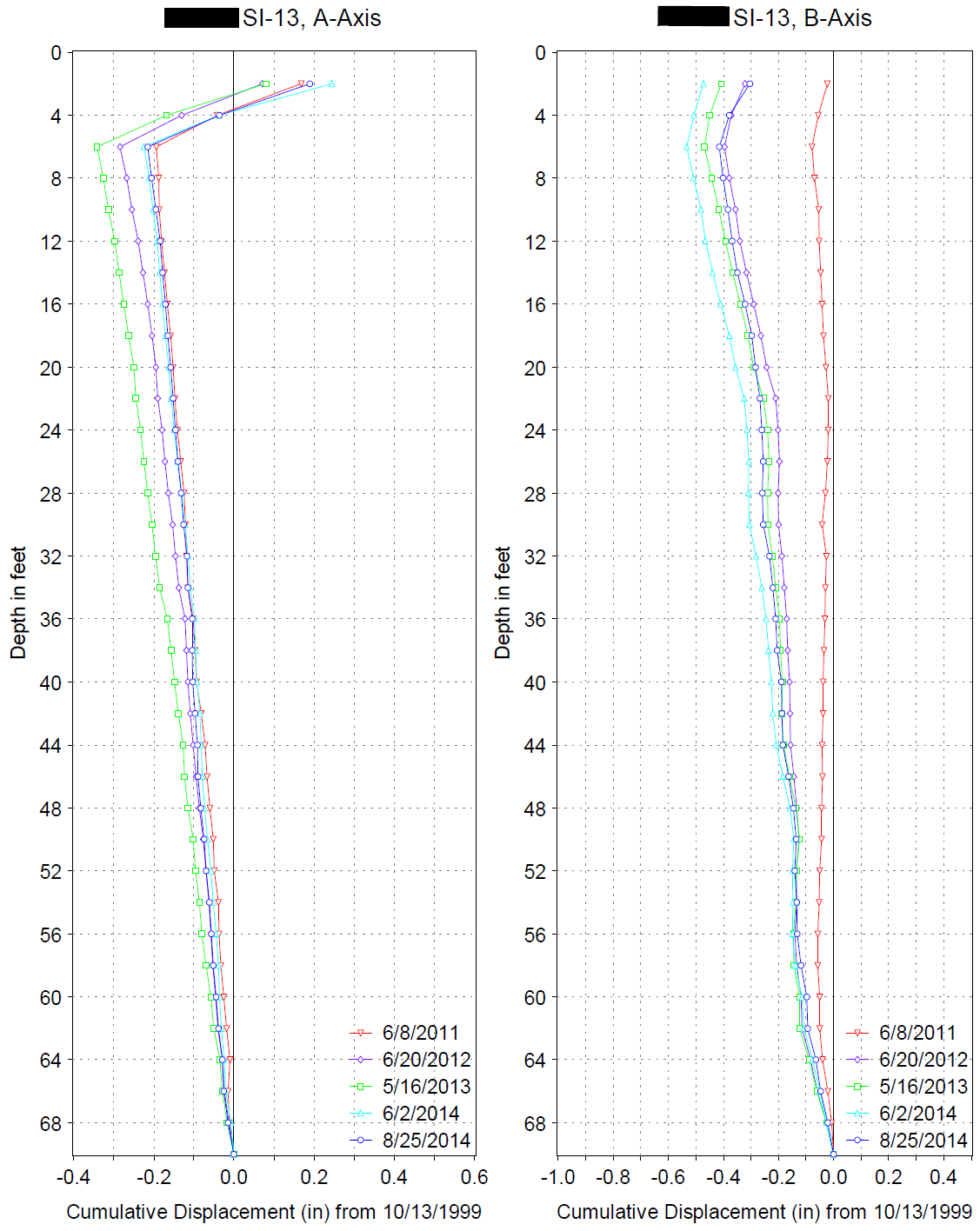


Figure E.56: Napa winery slope inclinometer data, SI-13

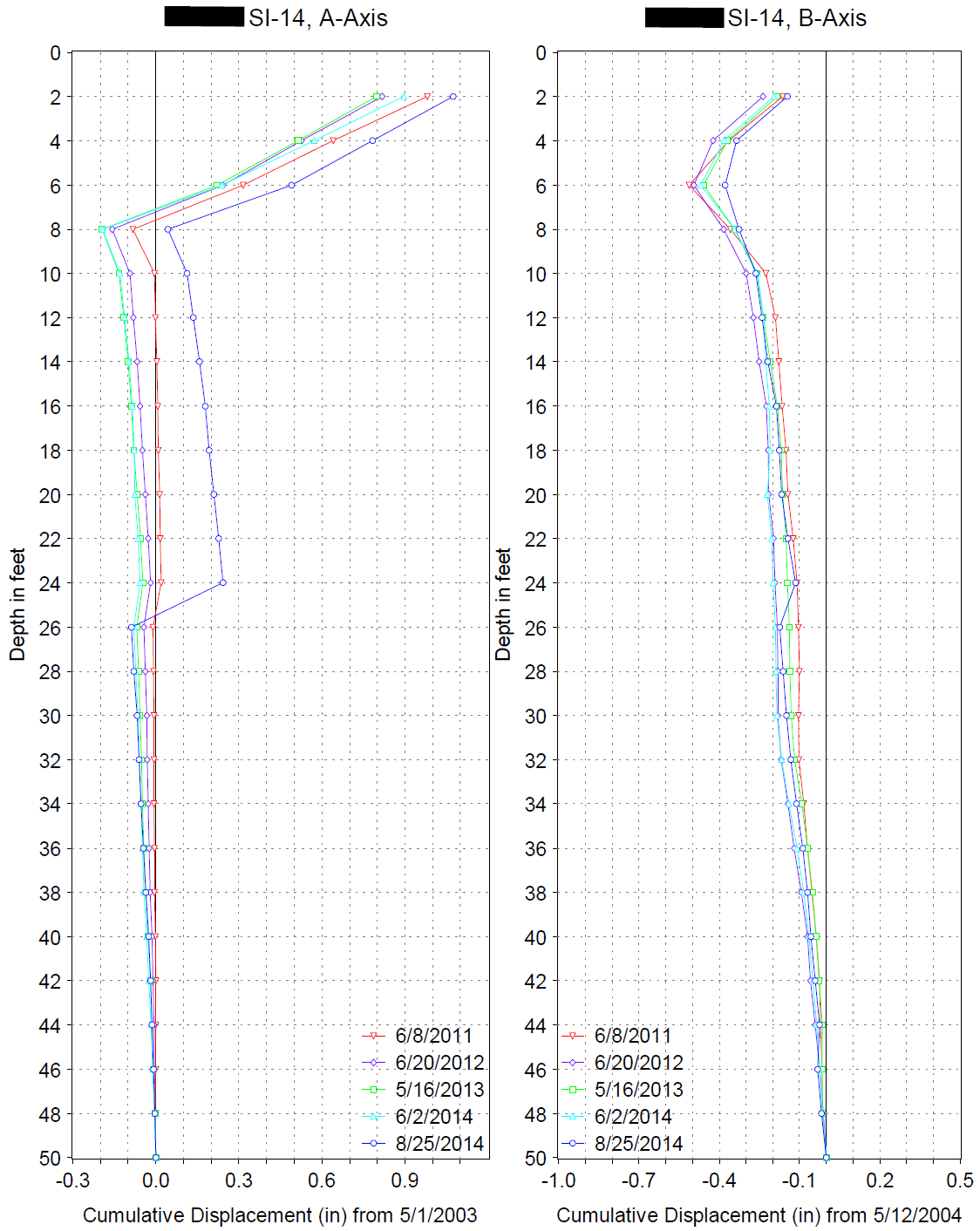


Figure E.57: Napa winery slope inclinometer data, SI-14

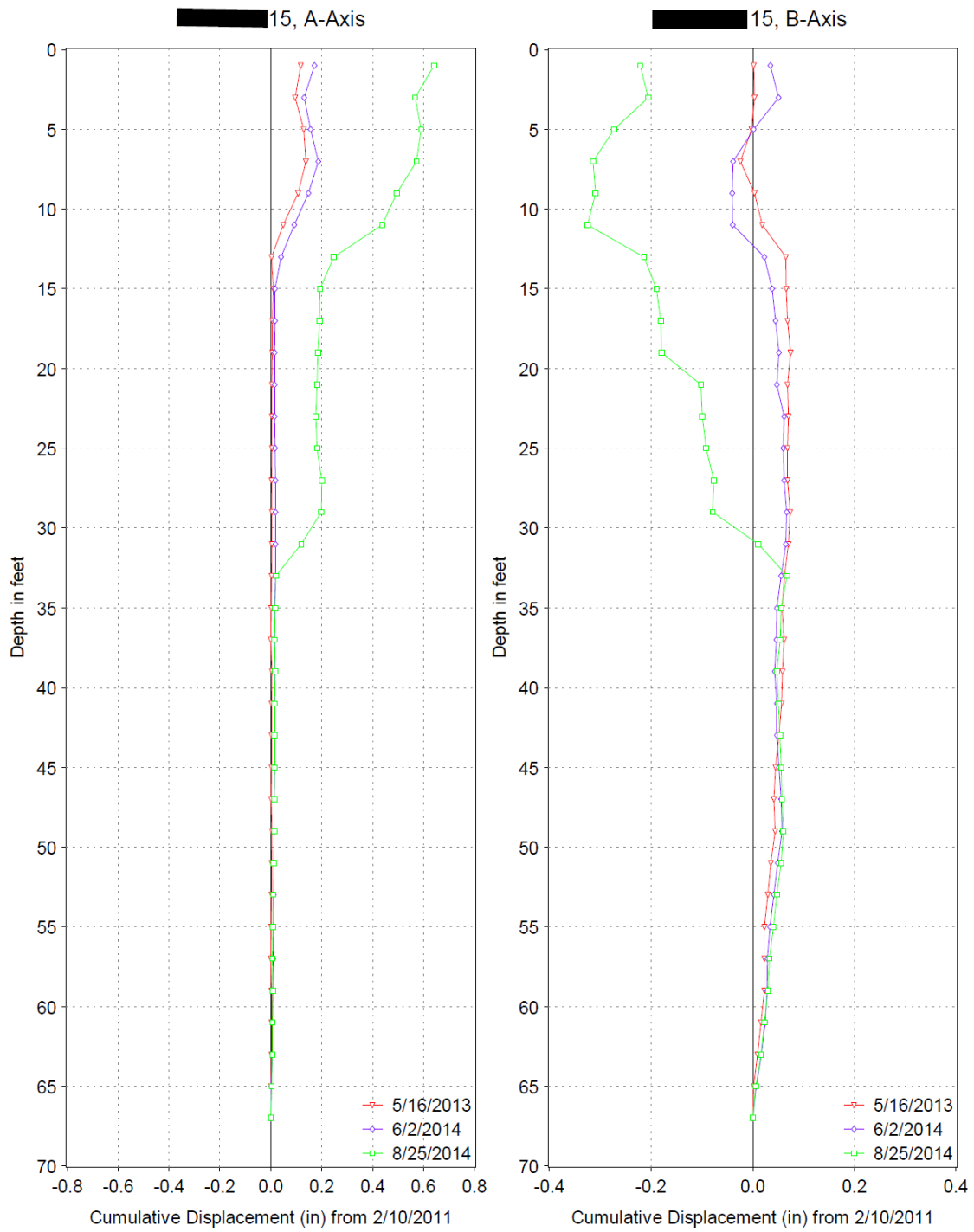


Figure E.58: Napa winery slope inclinometer data, SI-15

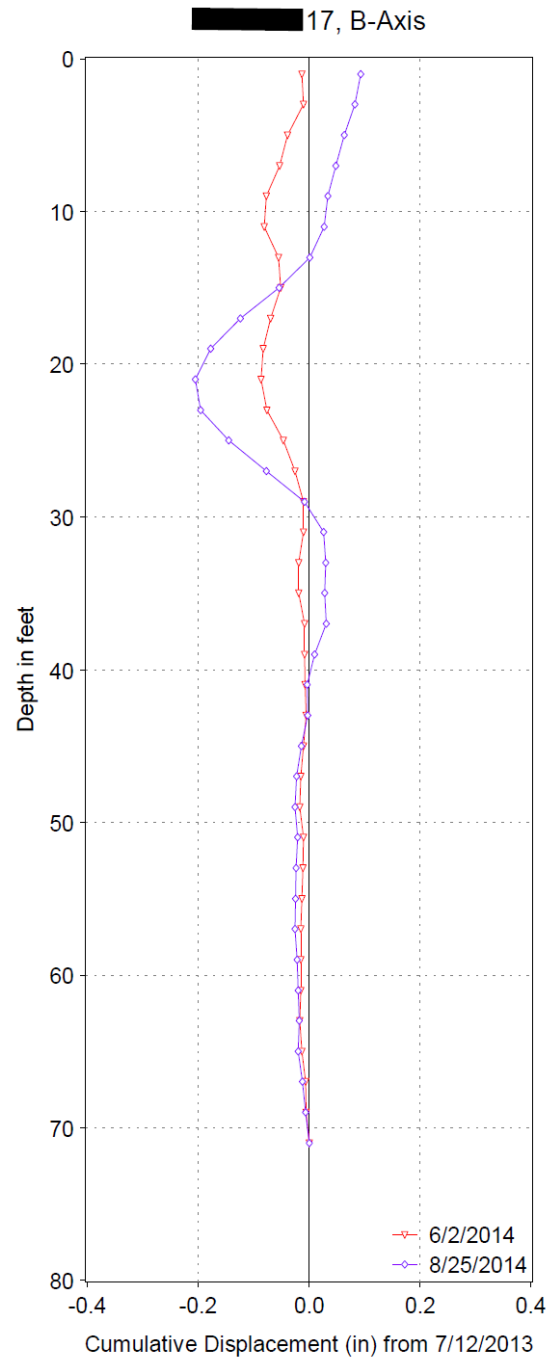
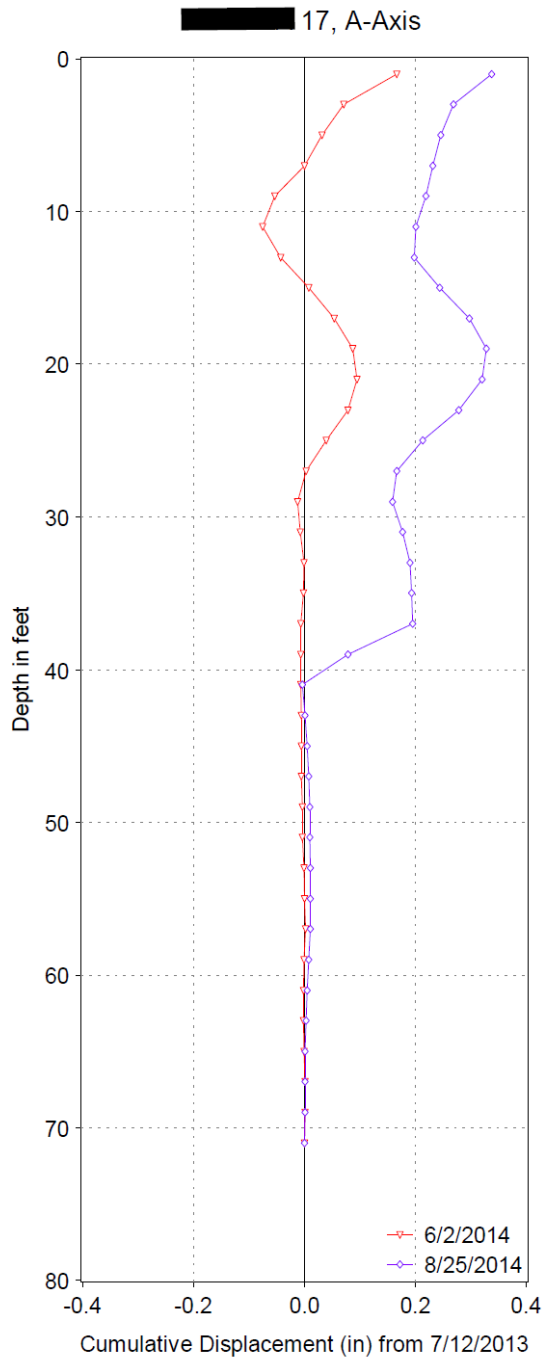


Figure E.59: Napa winery slope inclinometer data, SI-17