



Brief Data Collection & Processing Report
Lidar acquisition along the Calico fault: Towards an understanding of system-level behavior of the Pacific-North American plate boundary fault network in southern California
 Report Version 1.0 (20240320_jcfd)

Data Collection Summary:

Collection Dates, # Flights:	Single flight, on September 24, 2023 (DOY: 23_267) conducted out of the Big Bear Lake Airport, CA in conjunction with another project in the vicinity.
Aircraft, Equipment:	Piper Navajo PA-31 (Tail No. C-GJMT), LIDAR: Optech Titan (14 SEN/CON 340)
Flight Plan Parameters:	Flying Height: 700 m AGL, Swath Width: 800 m, Overlap: 50%, Line Spacing: 400 m
Equipment Parameters:	PRF: 125 kHz, Scan Frequency: 26 Hz, Scan Angle: $\pm 30^\circ$
Planned Laser Pulse Density:	Mean 8 pulses/m ²
Requested/Collected Area:	40 / 74.3 km ² The computation of collected area is based on DEM filled nodes.

GNSS Reference Station Summary:

L35_GSE03	N 34° 15' 43.25342", W 116° 51' 16.39771", 2029.230 m (Ellipsoidal) - ITRF2014 (EPOCH:2023.7308) Station used in final trajectory solution
RDMT, P613, P598	Other CORS and PBO stations for which data was downloaded and used to generate reference trajectories, but which were not used in final solution

Data Products Summary:

Horizontal / Vertical Datum:	WGS-84 based on ITRF2014 (EPOCH:2023.7308)
Projection / Units:	WGS-84 UTM Zone 11N meters - EPSG:32611
Point Cloud Tiles:	127 total 1000 m × 1000 m tiles in LAS format (Version 1.4), classified into ground (class 2 using strict parameters), close to ground (class 8 -0.2 m < h _{agl} ≤ 0.2 m), medium vegetation (class 4 based all intermediate returns), high noise (class 18), low noise (7).
Raster Sections	Each kind of raster data described below was generated for two raster sections (North and South).
Bare-Earth Elevation Model:	FLT format @ 50 cm grid spacing from classified ground returns.
First-Surface Elevation Model:	FLT format @ 100 cm grid spacing based only on first returns from all channels.
Additional Rasters:	None

A detailed summary of the equipment and processing techniques used by NCALM is included in the [Data Collection & Processing Summary](#).

Special notes:

1. Direct validation of the lidar datasets elevations within the project area was not conducted. However, data for validation of lidar heights for a previous flight with the same instrument (but different configuration) near Big Bear Lake, CA. That validation was based on 1020 kinematic GPS check points collected along a suburban road from a moving vehicle. A small statistical bias of 1.7 cm was found between the lidar elevations and the checkpoints, however this bias is lower than the vertical uncertainty of the Checkpoints. The precision of the lidar elevation was assessed at 2.58 cm (for all 3 channels combined).

2. Known data issues: There is slight corduroy on some areas of the DEM. Processing team tried its best at removing artifacts and refining calibration.

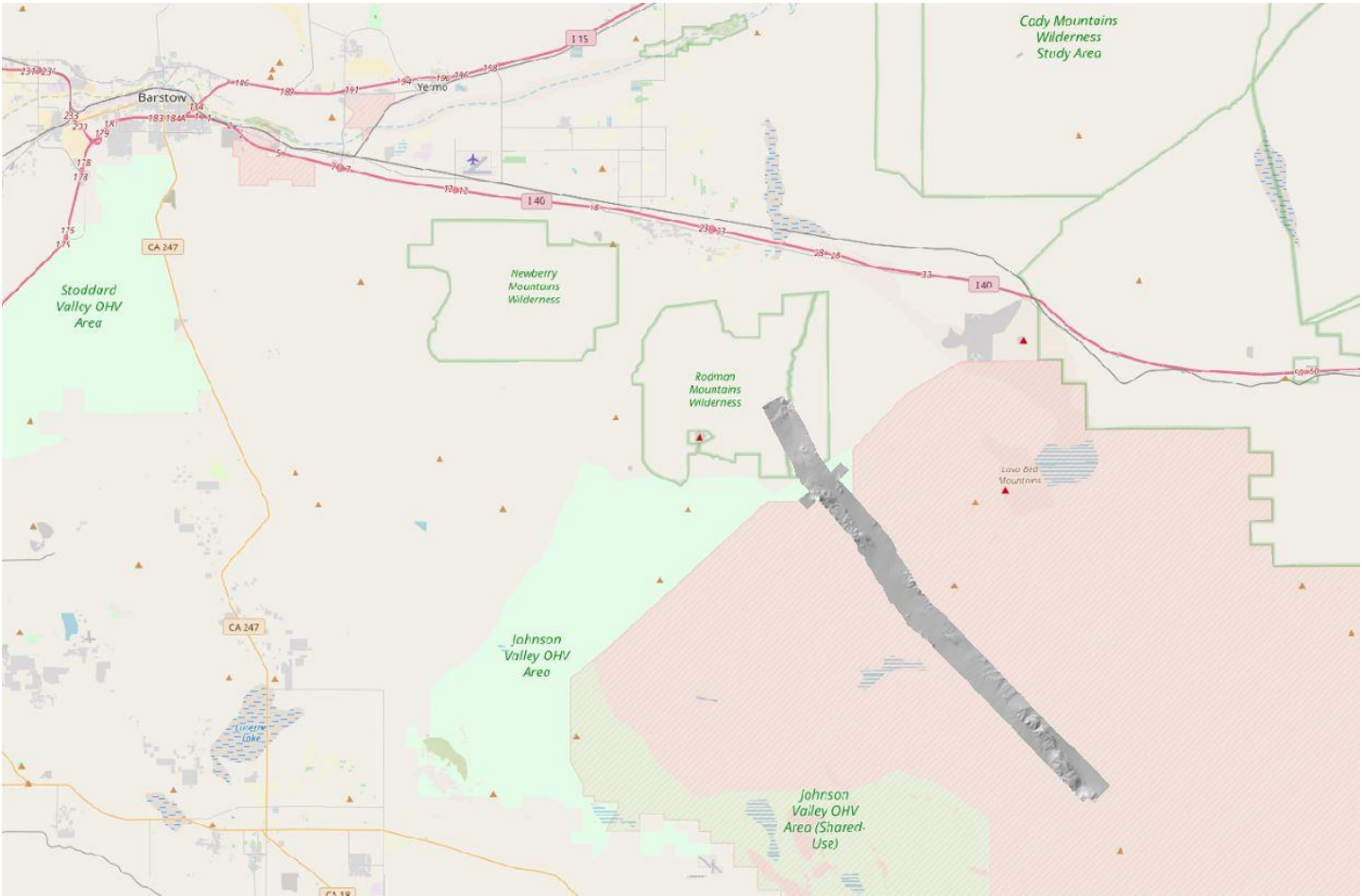


Figure 1. Mapped area of interest (DEM hillshade over Open Street Map).