



Data Collection & Product Report for Repeat Lidar Acquisition in Antelope Valley, CA

PI: William E. Dietrich (bill@eps.berkeley.edu)

University of California, Berkeley, Department of Earth & Planetary Sciences
313 McCone Hall, Berkeley, CA 94720

Data Collection Summary:

Collection Dates, Flights:	April 16–17, 2019 (DOY 106–107) comprising four (4) flights
Aircraft, Equipment:	Robinson R44 II (N233JD), with CRREL HeliPod Lidar (RIEGL VQ-480i)
Flight Plan Parameters:	Flying Height: 500 m AGL, Speed: 55 kt, Swath Width: 575 m, Overlap: 50%
Equipment Parameters:	PRF: 200 kHz, Scan Frequency: 70 Hz, Scan Angle: $\pm 30^\circ$
Imagery Flight Plan Parameters:	Collected simultaneously with Hasselblad A6D-100c
Collected Area:	24.3 km ² , ~47 laser pulses per square meter

GNSS Reference Station Summary:

Station Name	Operating Agency	Control Coordinates (NAD83(2011) epoch 2010.00/Ellipsoid)	RMS (OPUS)
P208	UNAVCO	39°06'33.47348" N, 122°18'13.87476" W, 74.798 m	0.011 m
P269	UNAVCO	38°59'58.27754" N, 122°21'16.33835" W, 298.732 m	0.012 m
P270	UNAVCO	39°14'37.55854" N, 122°03'18.71370" W, -11.817 m	0.009 m

Data Processing Summary:

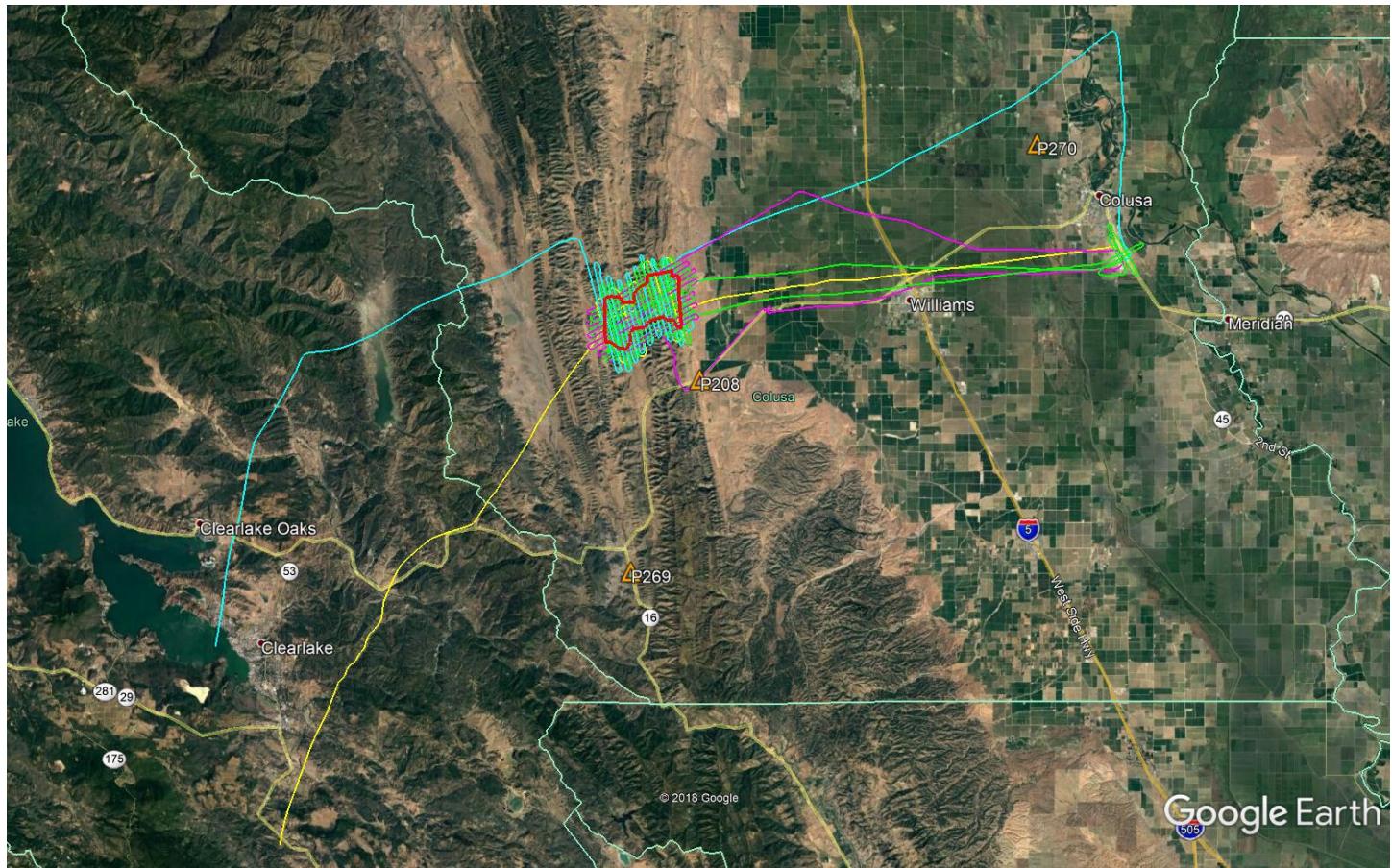
Scan Angle Cutoff:	3°
Intensity Normalization:	RIEGL reflectance
Data Adjustments:	Line-by-line roll orientation and elevation correction, project elevation shift of -3.4 cm
Ground Classification:	Two iterations of medium ground determination, manual classification of misclassified ground
Elevation Model Generation:	Elevation values calculated from Kriging
Data Accuracy	Strip-to-Strip Average: 0.043 m

Data Product Summary:

Horizontal / Vertical Datum:	NAD83(2011) epoch 2010.00 / NAVD88 (GEOID12B)
Projection / Units:	UTM Zone 10N / meters
Point Cloud Tiles:	1000-m \times 1000-m tiles in LAS format (Version 1.4) classified by non-ground (1), ground (2), low & high point (7) returns
Bare-Earth Elevation Model:	ESRI FLT format @ 1-m / 0.5-m / 0.25-m resolution from classified ground points
Bare-Earth Hillshade:	ESRI-created raster @ 1-m / 0.5-m / 0.25-m resolution
First-Surface Elevation Model:	ESRI FLT format @ 1-m / 0.5-m / 0.25-m resolution with canopy, and buildings included
First-Surface Hillshade:	ESRI-created raster @ 1-m / 0.5-m / 0.25-m resolution
Aerial Images:	Orthorectified 24-bit TIFF files

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

Area of Interest:



Location of survey polygon (in red), aircraft trajectories, and GNSS reference stations (in orange)

The requested survey area consisted of one polygon located near Antelope Valley Ranch, CA. The polygon enclosed approximately 12.9 km² (5.0 mi²).

Notes:

Some classified ground points may not be true ground. Thick vegetation will not allow the laser to penetrate to the ground. This can cause the ground point algorithm to classify the bottom of the vegetation or tree trunks as ground. Some low vegetation or fallen trees also get classified as ground, as the laser cannot distinguish between true ground and near-ground returns, and the algorithm has an eagerness to classify low points as ground. These factors can cause a rough appearance in the bare-earth elevation models. Boulders and rugged peaks often do not get classified as ground, as the terrain changes are too abrupt for the algorithm to classify successfully while not simultaneously classifying low vegetation as ground, too.

Due to the limited number of characters that can be used for ArcGIS data products, the resulting format is followed: NN_TDR##U. "NN" correspond to the 2-character identifier for the project or project area, "19" for this project (collected in the year of 2019). Character "T" represent the type of raster and it can be "G" for a grid, "H" for a hillshade. Character "D" represents what kind of data was used to create the raster (an "E" for elevation). Character "R" represents the type of return that was used for creating the raster and could be a "F" for first return or "G" for ground return. The characters "##" represent the raster resolution in decimeters. Finally, the last character "U" is an indicator for the unit of measurement. For e.g. a bare earth elevation grid with ground classified points and resolution 1 m will be named as: "19_GEG_01M.FLT"