Data Collection & Product Report for 2017 Seed Project: Ecosystem Structure as a Driver of Climatic, Habitat, and Hydrological Services in Heterogeneous Restored Wetlands

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Data Collection Summary:

Collection Dates, Flights:	September 20, 2018 (DOY 263) comprising one (1) flight
Aircraft, Equipment:	Piper PA-31 Navajo Chieftain (N640WA) with Optech Titan Lidar (14SEN340)
Flight Plan Parameters:	Flying Height: 450 m AGL, Speed: 130 kt, Swath Width: 520 m, Overlap: 50%
Equipment Parameters:	PRF: 150 kHz, Scan Frequency: 26 Hz, Scan Angle: ± 30°
Imagery Flight Plan Parameters:	Collected simultaneously
Collected Area:	61.7 km²

GNSS Reference Station Summary:

Station Name	Operating Agency	Control Coordinates (NAD83(2011) epoch 2010.00/Ellipsoid)	RMS (OPUS)
P248	UNAVCO	37°58'32.17703" N, 121°52'07.25758" W, 230.344 m	0.011 m
P273	UNAVCO	38°06'56.91143" N, 121°23'17.02781" W, -25.878 m	0.014 m
SHRM	NCALM	38°03'13.79002" N, 121°44'17.70104" W, -31.699 m	0.009 m

Data Processing Summary:

Scan Angle Cutoff:	± 1°
Intensity Normalization:	500 m
Data Adjustments:	Line-by-line/channel-by-channel orientation and elevation correction, project elevation shift of -13 cm
Ground Classification:	Two iterations of medium ground determination, manual classification of misclassified ground
Water Determination:	High density points more than 10 cm *below* classified infrared ground points, horizontal and vertical refraction correction
Elevation Model Generation:	Elevation values calculated from Kriging

Data Accuracy Summary

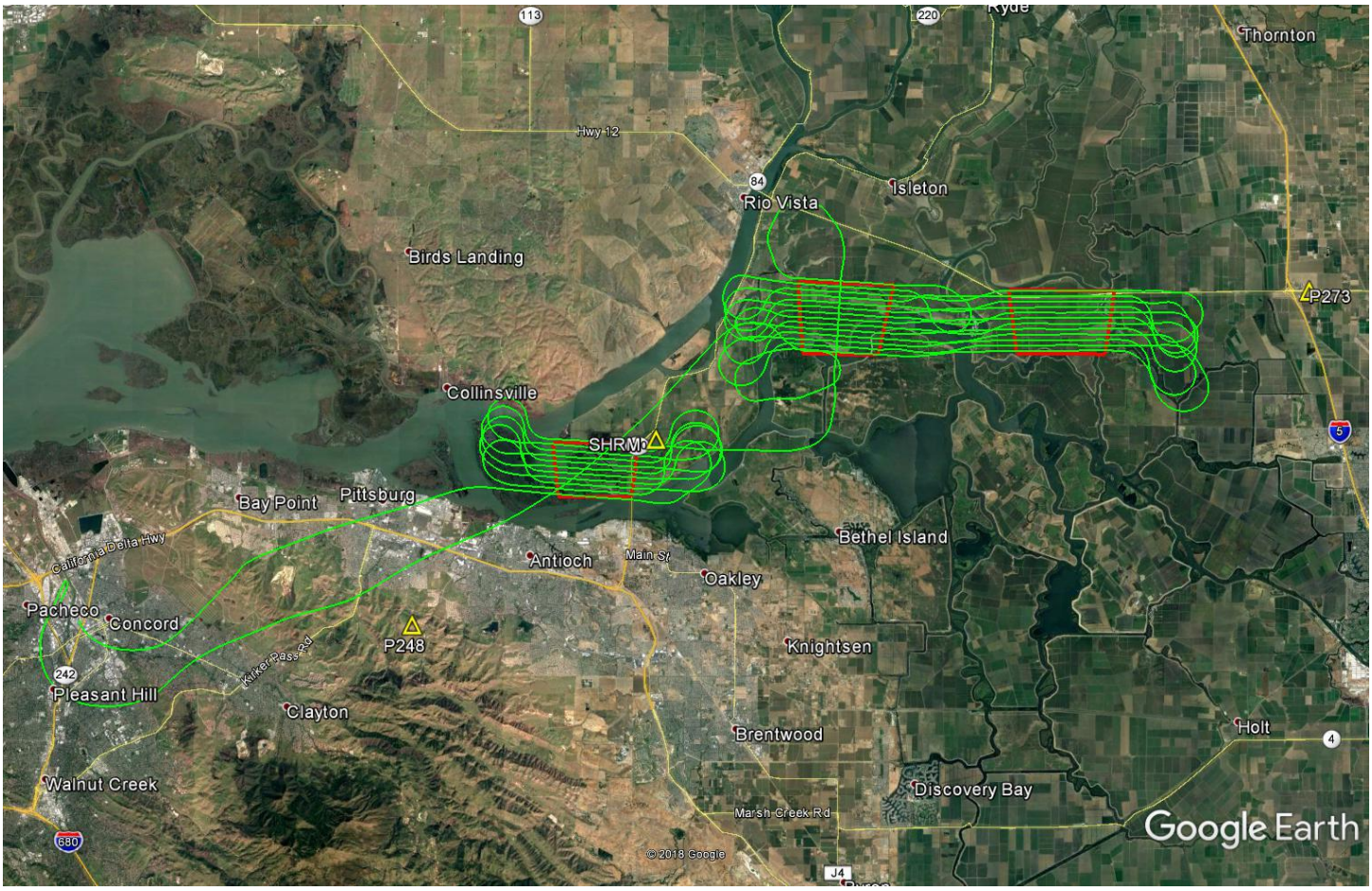
Strip-to-Strip Average	0.029 m
GCP Residual RMS	0.018 m

Data Product Summary:

Horizontal / Vertical Datum:	NAD83(2011) epoch 2010.00 / NAVD88 (GEOID12B)
Projection / Units:	UTM Zone 10N / meters
Point Cloud Tiles:	1000-m × 1000-m tiles in LAS format (Version 1.4) classified by non-ground (1), ground (2), low point (7), water (9), and high point (18) returns
Bare-Earth Elevation Model:	ESRI FLT format @ 1-m resolution from classified ground points
Bare-Earth Hillshade:	ESRI-created raster @ 1-m resolution
First-Surface Elevation Model:	ESRI FLT format @ 1-m resolution with canopy and water included
First-Surface Hillshade:	ESRI-created raster @ 1-m resolution
Aerial Images:	Radiometrically corrected and rectified 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 polygons (in red), aircraft trajectory, and GNSS reference stations (in yellow)

The requested survey area consisted of three polygons located on Sherman Island, Twitchell Island, and Bouldin Island, northeast of Antioch, CA. The polygons enclose approximately 36.3 km^2 (14.0 mi^2).

Notes:

Due to thick and/or short vegetation, some classified ground points may not be true ground. Extremely thick vegetation, as is present in places on the surveyed islands, will not allow the laser to penetrate to the ground. This can cause the ground point algorithm to classify the bottom of the vegetation as ground, especially if the vegetation is low. Some low vegetation also gets 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. This can cause a rough appearance in the bare-earth elevation models. The ground point algorithm was allowed a level of aggressiveness in classifying lower points as ground to maximize the amount of true ground points. This was done to allow taller vegetation to be more easily classified in later analysis.

Effort was made to ensure that points defined as water were not, in fact, misclassified low points, but some may be present. Classified and corrected water points are not confirmed to be from the benthic layer and may be returns from within the water column. Water determination is especially difficult in water with high turbidity, which is true of much of the moving or standing water in the project area. No distinction was made between water surface, water column, or water bottom in the data.