Data Collection & Product Report for 2019 Seed Project: Understanding Modern Coastal Sediment Accretion Rates and Spatial Patterns in the Wax Lake Delta, LA

PI: Justin Nghiem (jnghiem@caltech.edu)
California Institute of Technology, Division of Geological & Planetary Sciences
1200 E California Blvd, Pasadena, CA 47405

Data Collection Summary:

Collection Dates, Flights:	1 flight on November 16, 2020 (DOY 321)
Aircraft, Equipment:	Piper PA-31-350 Navajo Chieftain (N640WA), Optech Titan (14SEN340)
Flight Plan Parameters:	Flying Height: 400 m AGL, Speed: 160 kt, Overlap: 50%
Equipment Parameters:	PRF: 150 kHz, Scan Frequency: 26 Hz, Scan Angle: ± 30°
Collected Area:	47.2 km²

GNSS Reference Station Summary:

Station Name	Operating Agency	Control Coordinates (NAD83(2011) epoch 2010.00/Ellipsoid)
GSE3	NCALM	29°42'44.40136" N, 91°19'56.94992" W, -22.789 m

Data Processing Summary:

Scan Angle Cutoff:	± 1°
Intensity Normalization:	400 m
Point Cloud Classification:	Ground classification was done using a morphological filter in Terrascan and points included in class 2. Bathymetry points classification was done on returns from green laser i.e. channel 3 over the waterbody. Due to the characteristics of the water body (murky water, dark bottom), it cannot be ascertained with 100% certainty that the laser returns from shots of green channel that penetrated the water column, are from the bottom. The lowest returns were classified as the bathymetry points (class 14) as they have the highest probability of representing the water body bottom. All the other green channel points (channel 3) over the water body were classified separately in class 9 as water points. The points over the water surface from the IR laser channels (channel 2 and 3) were classified in class 15 as water surface. Class 1 includes the unclassified points from Channels 1,2 and 3.
Elevation Model Generation:	First-return digital surface model as well as the bare-earth digital elevation model (from bathymetry points and ground classified points) were created using Kriging

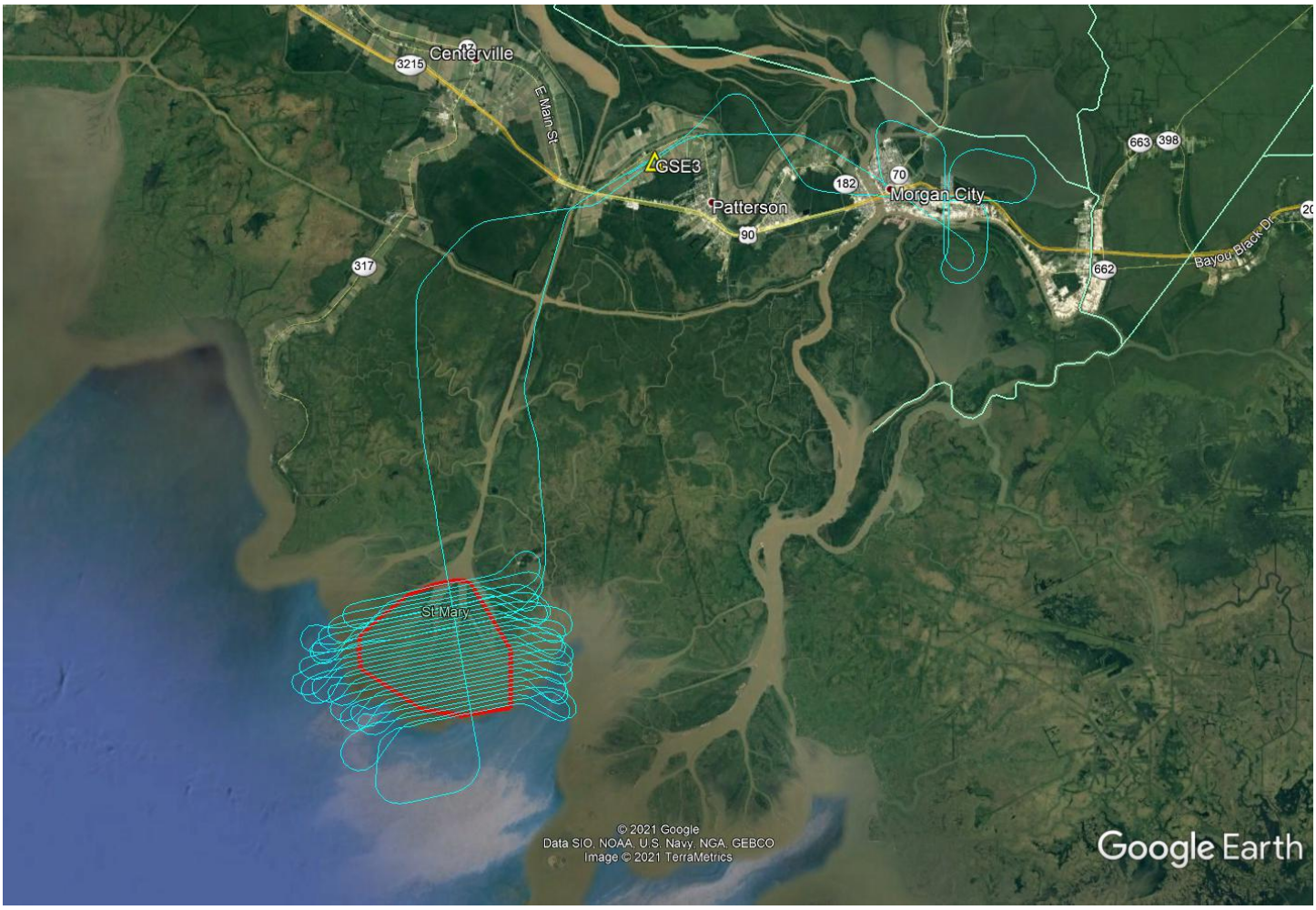
Data Accuracy Summary

GCP Residual RMS	0.013 m : calculated by comparing lidar data with control points collected over the calibration area

Data Product Summary:

Horizontal / Vertical Datum:	NAD83(2011) epoch 2010.00 / NAVD88 (GEOID 18)
Projection / Units:	UTM Zone 15N / meters
Point Cloud Tiles:	1000-m × 1000-m tiles in LAS format (Version 1.4)
Point Classes:	1: Unclassified – all channels 2: Ground – all channels 9: Water – from channel 3 (green) 14: Bathymetric Points – channel 3 (green) 15: Water Surface Points – channel 2 and 3 (IR channels)
Bare-Earth Elevation Model:	GeoTIFF @ 1-m resolution from classified ground and bathymetry points
First-Surface Elevation Model:	GeoTIFF @ 1-m resolution with vegetation and water surface included

Area of Interest:



Location of survey polygon, aircraft trajectory, and GNSS reference station

The requested survey area consisted of one polygon located southwest of Morgan City, LA. The polygon enclosed approximately 40.0 km^2 (15.4 mi^2).

Please note that in order to conform with standard ASPRS LAS point classification standards, these datasets have had their point classifications re-assigned. The datasets now have the following point classifications:

- 1: Unclassified – all channels
- 2: Ground – all channels
- 9: Water – from channel 3 (green)
- 40: Bathymetric Points – channel 3 (green)
- 41: Water Surface Points – channel 2 and 3 (IR channels)

Points previously classified as point class 14 are now point class 40, and points classified as 15 are now class 41. These classifications align with the proposed point classification standards for Topo-bathy data from ASPRS.