



Data Collection & Processing Report for 2017 NSF Rapid Response Project along the Mission River in Refugio, TX after Hurricane Harvey

**PI: Inci Guneralp, Ph.D. Associate Professor
Department of Geography, College of Geosciences
Texas A&M University, College Station, TX 77843**

Data Collection Summary:

Collection Dates, # Flights:	March 08, 2018 (DOY 067), Two (2) Flights
Aircraft, Equipment:	Aero Commander 500 (Tail No.: N742WX), Lidar: Optech Titan (14SEN/CON340), Hyperspectral: ITRES CASI-1500 (SHU 2525, ICU 12028)
Flight Plan Parameters:	Flying Height: 500 m AGL, Swath Width: 575 m, Overlap: 50%, Line Spacing: 200 m
Equipment Parameters:	PRF: 175 kHz, Scan Frequency: 25 Hz, Scan Angle: ± 30°
Requested/Collected Area:	45 / 68.71 (based on C123 DSM) km ²

GNSS Reference Station Summary:

TXCC	CORS station operated by TXDOT in Corpus Christi, TX	27°44'26.85515" N, 97°26'30.01053" W, -9.086 m (Ellipsoid)
TXPO	CORS station operated by TXDOT in Port Aransas, TX	27°50'22.06009" N, 97°04'11.64836" W, -19.432 m (Ellipsoid)
BRAN	Base Station set up by NCALM at Aransas County Airport	28 5 24.80219 N, 97 2 46.11469 W, -19.333(m) (Ellipsoid)

Data Products Summary:

Horizontal / Vertical Datum:	NAD83(2011) / NAVD88 (GEOID12A)
Projection / Units:	UTM Zone 14N / meters
Point Cloud Tiles:	<p>1000 m × 1000 m tiles in LAS format (Version 1.2), classified into following classes:</p> <ol style="list-style-type: none"> 1) Unclassified – Class 1 2) Ground – Class 2 3) Low Vegetation – Class 3 (h ≤ 0.5 m from ground) 4) Medium Vegetation – Class 4 (0.5 m < h from ground ≤ 1.5 m) 5) High Vegetation – Class 5 (h > 1.5 m from ground) 6) Buildings – Class 6 7) Bathymetry – Class 9 8) Water column returns Channel 3 – Class 38 9) Water Surface IR Channels – Class 39 <p>* Each of the returns contained on the LAS tiles are encoded with a laser channel value. The values used are 1 (1550 nm), 2 (1064 nm), and 3 (532 nm), and are stored in the 'User Data' record of the Point Data records in the LAS file.</p> <p>* Lidar height was validated against 38 stop-and-go kinematic GPS measurements obtained at the Aransas County Airport (KRKP), accuracy of lidar elevations was assessed at 0.031 m (* based on a small number of samples).</p>
Digital Elevation Models:	<p>ESRI FLT format @ 0.5-m resolution for the following:</p> <ol style="list-style-type: none"> 1) DEM from classified ground and bathymetry returns from all channels 2) DEM from classified ground returns from Channels 1 and 2 (IR only) 3) DSM from first returns from all channels (C1C2C3) 4) DSM from first return from Channels 1 and 2 5) Water surface grid from point class 39 (REFG_GEW05.flt) 6) Bathymetry grid from point class 9 (REFG_GEB05.flt)
Hyperspectral Images	<p>72 Band, 1.5 m pixel size, The PCIDSK (.PIX) format. The digital number in the PIX image corresponds to milli-SRU (spectral radiance units). One SRU is equivalent to one microwatt per square-centimeter per steradian per nanometer.</p> <p>Files are provided as individual flight strips as well as a single mosaic file of flight strips.</p>

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

Area of Interest:

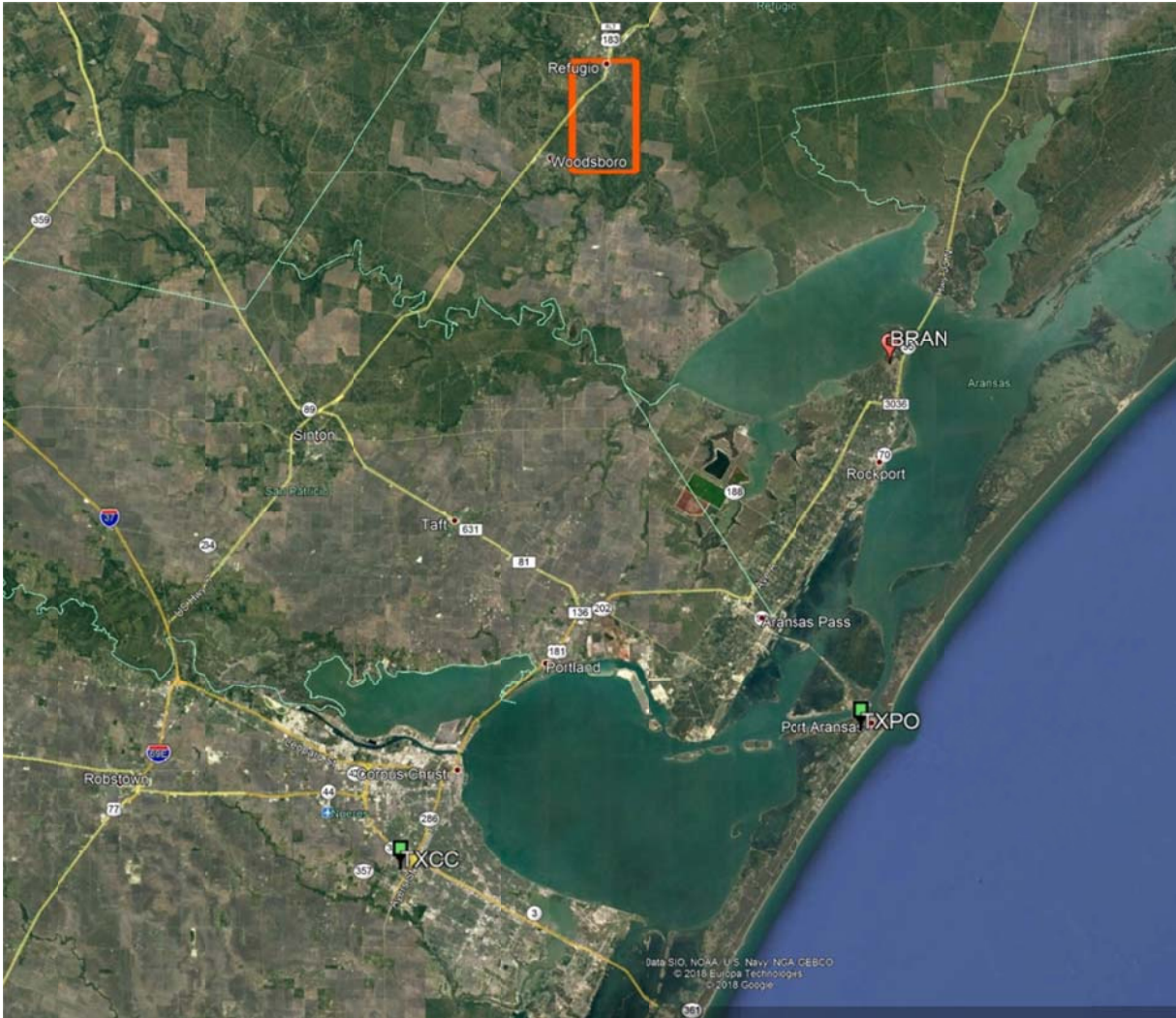


Figure 1. Location of survey polygon (in red) and GNSS reference stations (Bran, TXPO and TXCC)

File Naming Schemes:

LAS Point Cloud Files

The 1000 m × 1000 m tiles follow a naming convention using the lower-left coordinate (minimum X, Y) of the UTM coordinates as the seed for the file name as follows: XXXXXX_YYYYYYY. For example, if the tile bounds are the coordinate values from Easting 670000 through 671000, and Northing 3130000 through 3131000, then the tile file-name incorporates 670000_3130000.

ESRI Files

Due to the limited number of characters that can be used for ArcGIS data products, the resulting format is followed: NNNN_TDR##. “NNNN” correspond to the 4 character identifier for the project or project area, “REFG” for this project. Character “T” represent the type of raster and it can be “G” for a grid, “H” for a hillshade or S for Sky view Factor (SVF), etc. Character “D” represents what kind of data was used to create the raster. It can be an “E” for elevation, “I” for intensity or “D” for density. 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, C for canopy height model, B for benthic, W for water surface, etc. The last two characters “##” represent the raster resolution in decimeters. For e.g. A bare earth elevation grid with ground classified points and resolution 50 cm will be named as: “REFG_GEG05.FLT”