Metadata Report

Project Name: A Comprehensive Analyses of Sediment Delivery to Lake Michigan from Coastal Bluffs in South Eastern Wisconsin- Sheboygan WI (05/22/2018)

Summary: High lake levels are reducing beach area along the Lake Michigan coastline and allowing wave action to erode the bases of coastal bluffs at the highest rate of the past 30 years. Sediment budget calculations have shown that b luff erosion is the dominant source of sand and gravel-sized particles that are mobilized into beaches and the nearshore system. Researchers have found that the leading cause of bluff erosion is shallow to intermediate depth translational landslides. Therefore, estimating lake sediment budgets depends on an understanding of the mechanisms that lead to landslide failure. This study will provide a comprehensive analysis of bluff stability for bluffs affected by landslide failure coupled with an analysis of bluff composition to determine the composition of sediment contributions of coastal bluffs to the southeast Lake Michigan sediment budget.

This dataset is part of a series of repeat surveys documenting temporal changes to a 0.5 km extent of unconsolidated coastal bluffs on Lake Michigan.

PI: LK Zoet, *UW Madison* & JE Rawling III, *UW Extension*

Additional team members: R Krueger, C Volpano

Site Information

Survey area is approximately 0.5 km of actively eroding bluffs composed of unconsolidated glacial sediments. Bluff height is approximately 15-20 m from beach level. Beach composition is sand and cobbles (1-10cm).

Site objective: Use of aerial imagery and SfM to construct accurate, a high resolution DEMs on multiple occasions for use in sediment volume and shoreline

change analysis.

Site conditions: Sunny, Calm weather

Survey Results

Equipment used: DJI Phantom 4 Advanced, Trimble NetR9 Base+Rover

Errors: Control points RMSE: [X (cm) 1.265] [Y (cm) 1.212] [Z (cm) 0.752] [Total (cm) 1.90739]

*For additional model parameters see attached Photoscan Processing Report

Collection methods: Flight path created using Maps Made Easy app for iPad with 80% image overlap with nadir angle and a ground resolution of 1.34 cm/pix. Additional oblique images were taken manually. 9 GCP coordinates were acquired using Trimble Net R9 Base+Rover and post-processed using TopCon tools.

Products

Coordinate system of datasets: WGS 84 UTM Zone 16N (ESPG:32616)/ NAVD88

Spatial resolution: 1.34 cm/pix

Horizontal Accuracy: XY RMSE (cm) 1.752

Vertical Accuracy: Z RMSE (cm) 0.752

Data formats: LAZ point cloud, Raster DEM Tiff (Unedited Point Cloud)

Misc Notes

This project funded by Wisconsin Sea Grant Award Number R/RCE-08

This dataset included in a thesis for partial completion of a Master's degree from University Wisconsin, Madison WI (Krueger 2019)