

# **Dewberry Response to USGS/FEMA Region 2 Review of the NY Great Lakes Area QL2 LiDAR - Orleans County Processing Project**

Produced for U.S. Geological Survey

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## **Executive Summary**

The primary purpose of this project was to develop a consistent and accurate surface elevation dataset derived from high-accuracy Light Detection and Ranging (LiDAR) technology for the USGS/FEMA Region 2 NY Great Lakes - Orleans County LiDAR Project Area.

The LiDAR data were processed to digital surface models (DSM) and bare-earth digital terrain models (DTM). Detailed breaklines and bare-earth digital elevation Models (DEMs) were produced for the project area.

Deliverables for this project included raw point cloud data, classified point cloud data, bare earth not hydro-enforced digital terrain models, bare earth hydro enforced digital elevation models, intensity images, breaklines, control points, metadata, project report, and project extent shapefiles.

The USGS review of these deliverables resulted in two calls. One was to fix a hydro flattening issue. The second call was a general call about mismatching between the redelivered DEM tiles.

## PROJECT AREA

Data was formatted according to tiles with each tile covering an area of 1500m by 1500m. A total of 507 tiles were produced for the project encompassing an area of approximately 393 sq. miles.



Figure 1- Project Map

### HYDRO-FLATTENING ISSUE

There was one location where USGS identified an area of water that was not hydro flattened uniformly with its neighboring tiles. The affected tile was reprocessed in the same manner as the neighboring tiles, correcting the issue so that the hydrographic feature is consistent across tile boundaries. Another water feature was found during review that had a small hydro flattening issue and this feature has also been fixed.

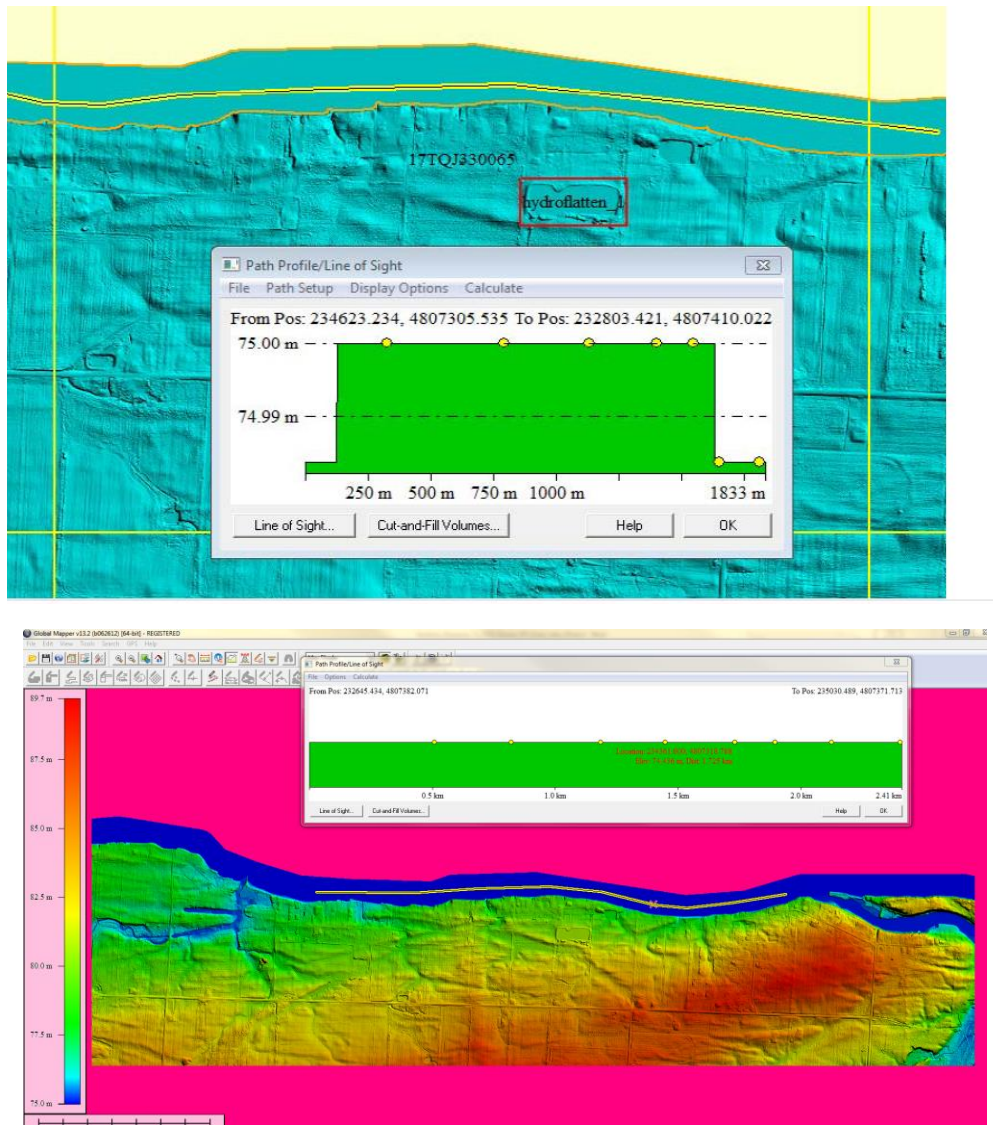


Figure 2 – Tile 17TQJ330065. Issue seen by USGS in top image and corrected DEMs shown in bottom image.

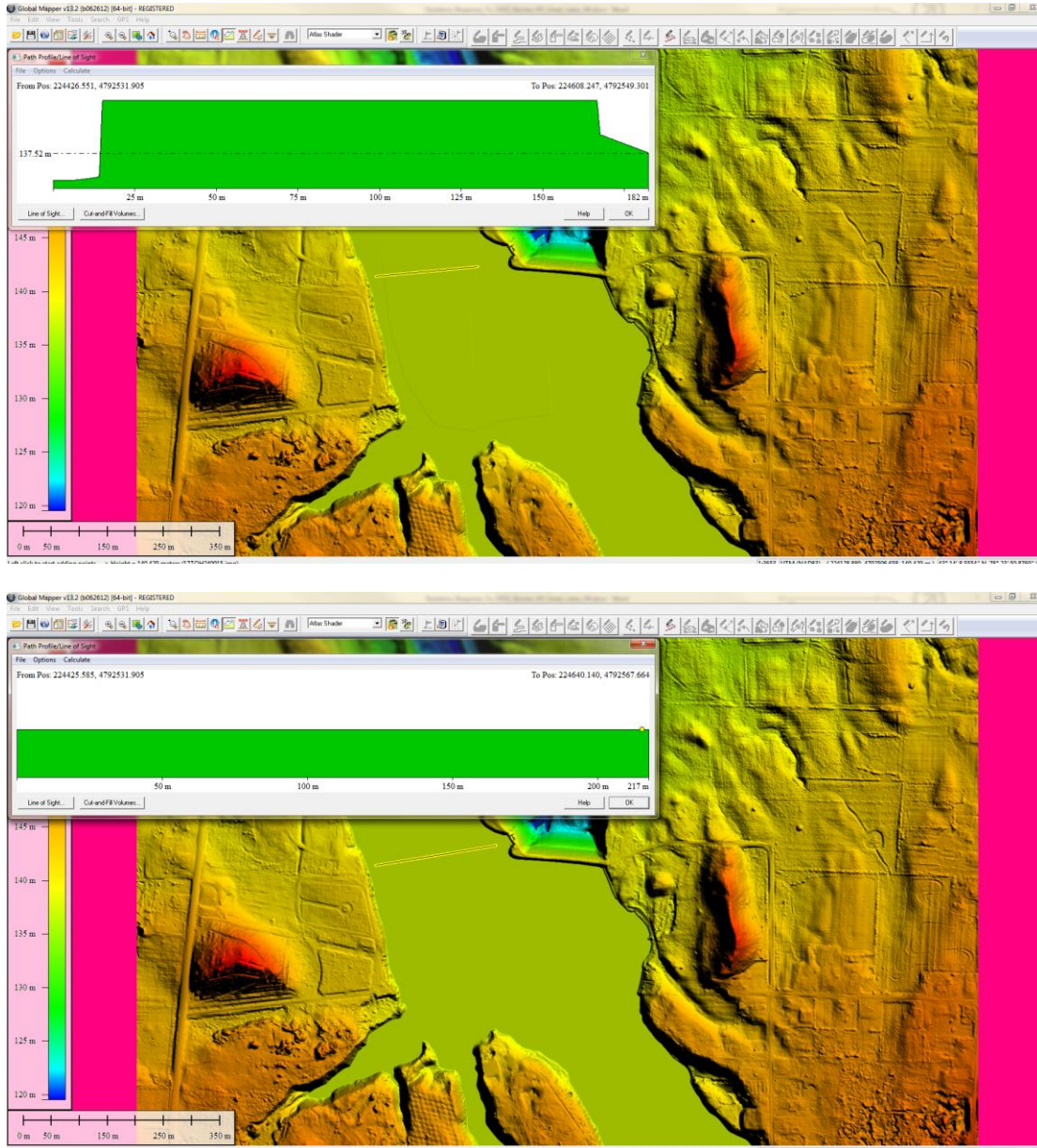


Figure 3 – Tile 17TQH240915. Issue seen while doing internal review. Top is old DEM with hydro flattening issue, bottom is the same cross-section of fixed DEM.

## DEM EDGE MATCHING

There was a general call made by USGS that the DEMs did not have proper edge matching. The edge issues identified by USGS are only visual artifacts created by Global Mapper along tile boundaries. Global Mapper creates the appearance of a small elevation shift between the tiles because of the way it renders hillshading on a tile by tile basis, creating a false ridge between the border pixels. Global Mapper usually creates this small visual artifact on all tiled data, but it is typically more apparent in flat terrain and may ‘disappear’ in sloped areas. If tiled DEMs are merged or mosaicked into a single DEM, all edge artifacts will disappear because they are not actually in the elevation dataset, but are merely a visual artifact caused by Global Mapper. The screenshots below show a comparison of two cross sections in the same location: one is with the delivered tiled data and the other is with a one merged, non-tiled raster.

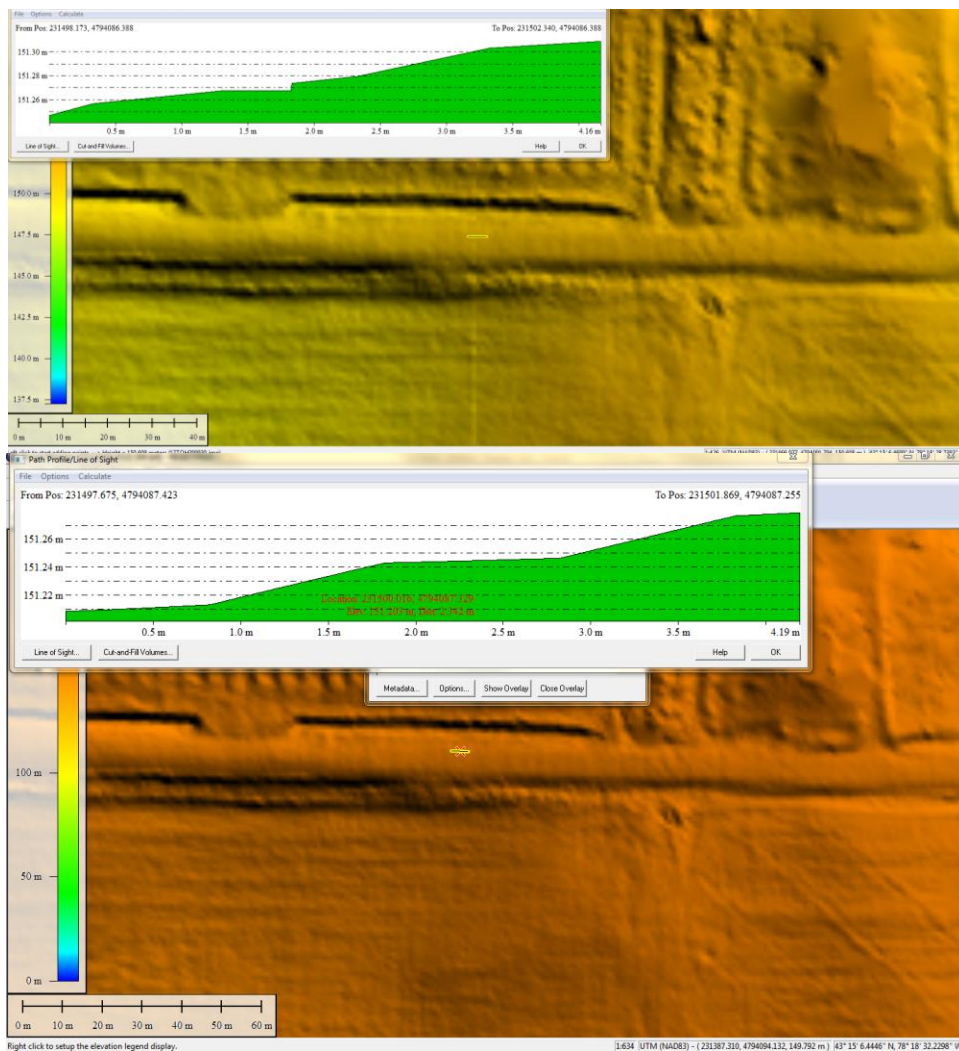


Figure 4 – Tiles 17TQH300930 and 17TQH315930. The top image is the tiled data and shows the visual artifact created by Global Mapper on all tiled data. The bottom image is the merged, non-tiled raster with a cross-section in the same location showing there are no actual artifacts or ridges present in the elevation data.

## **Summary of Edit Calls**

- Two hydro flattening calls have been corrected and delivered.
- One general DEM call for artifacts along DEM edges has been addressed in this report but did not require any corrections or modifications to the DEM files.